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JANUARY, 1961

MODERN METALS

JAN 3 0 1961

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LIGHT METALS
Man of the Year



Siding Pioneer **Jerry Kaufman**

His Alside, Inc. started it all back in 1947; still dominates a burgeoning industry that should use 150,000 tons of aluminum to produce 600 million square feet of siding annually by 1965.

(see page 44)



... America's
One Best Source
of Extrusion Tools



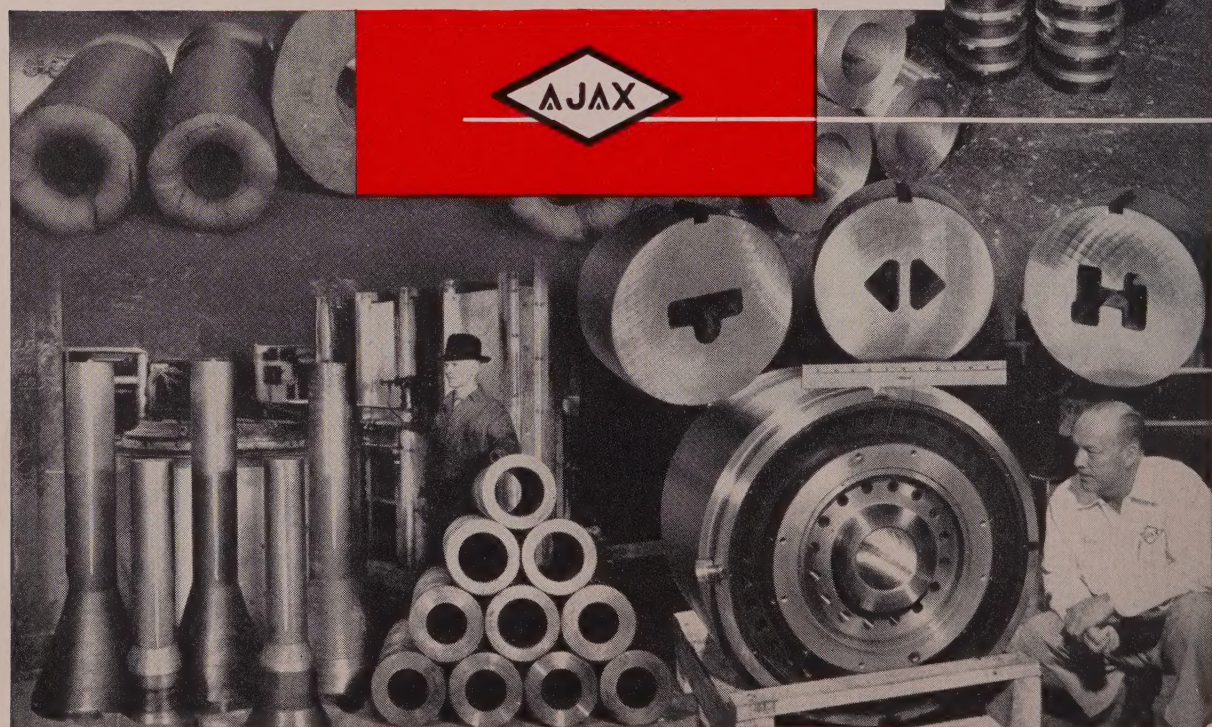
AJAX

Steel and Forge Co.

205 ADAIR ST.

DETROIT 7, MICHIGAN

LOrain 7-0755





miss is as good as a thousand miles

the higher you aim
for new **productivity**
the more you need
Scovill's "count down"
on quality



SCOVILL

brass
copper
aluminum
MILL PRODUCTS

MADE IN USA

... and made better to bring out the **BEST** in your products

SCOVILL MANUFACTURING COMPANY
Mill Products Division, 99 Mill St., Waterbury 20, Conn., Phone Plaza 4-1171

6SC60



SCOVILL

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fault-free metals
® for **high speed**
fabrication

Advanced mill processes — Scovill pioneered the CONTINUOUS CASTING of Brass alloys to bring fabricators of Brass Mill Products the new standard of metal soundness and uniformity made possible by this unique process. Other more recent new mill installations at Scovill include precision-controlled Aluminum rolling mills; the advanced Sendzimir Mill for extra-close-tolerance sheet and strip; the World's largest vertical tube extrusion press, with automatic induction billet-heating equipment, as well as one of the Industry's newest and largest specialized tube mills.

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Make Scovill a part of your competitive team, let us contribute our wealth of experience and ultra-modern equipment to the success of your NEW products and production plans.

SCOVILL MANUFACTURING COMPANY

Mill Products Division, 99 Mill Street, Waterbury 20, Conn. Phone PLaza 4-1171



MADE IN USA

... and made better to bring out
the **BEST** in your products

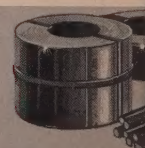
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BRASS

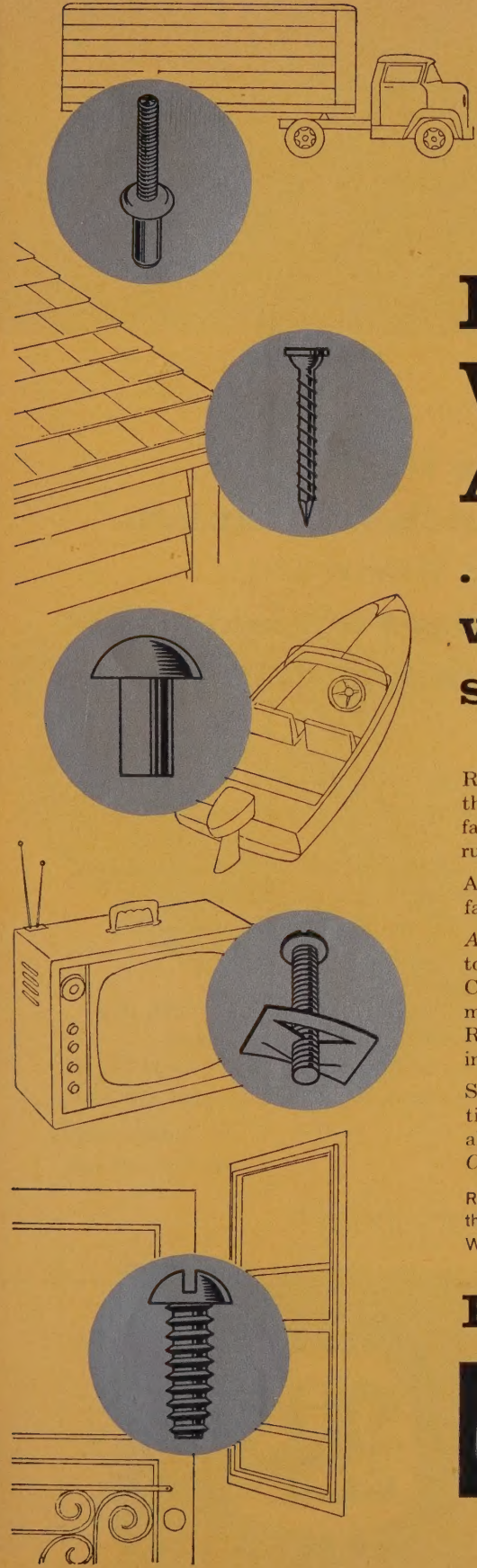


COPPER



ALUMINUM

MILL PRODUCTS



FASTEN WITH ALUMINUM

**...your product
will look better longer,
stay much stronger**

Rusted fasteners—and the stains and weakened joints they cause—just can't happen if you specify *aluminum* fasteners. Aluminum provides protection against harmful rust; it resists corrosion; it will not weaken with age.

And, if your product requires maintenance, aluminum fasteners never bind because of rust!

Always fasten aluminum parts with aluminum fasteners to prevent deterioration possible with dissimilar metals. Consider aluminum components and fasteners for other materials—wood, plastic, textile and plaster products. Remember: even coated ferrous fasteners can be damaged in assembly and create corrosion problems at a later time!

See your fastener supplier or your Reynolds representative about the many ways products can be improved with aluminum fasteners. Or, write to the *Reynolds Metals Company, P.O. Box 2346-NL, Richmond 18, Virginia.*

Reynolds does not make aluminum fasteners, but does supply the finest quality aluminum to the fastener industry . . .

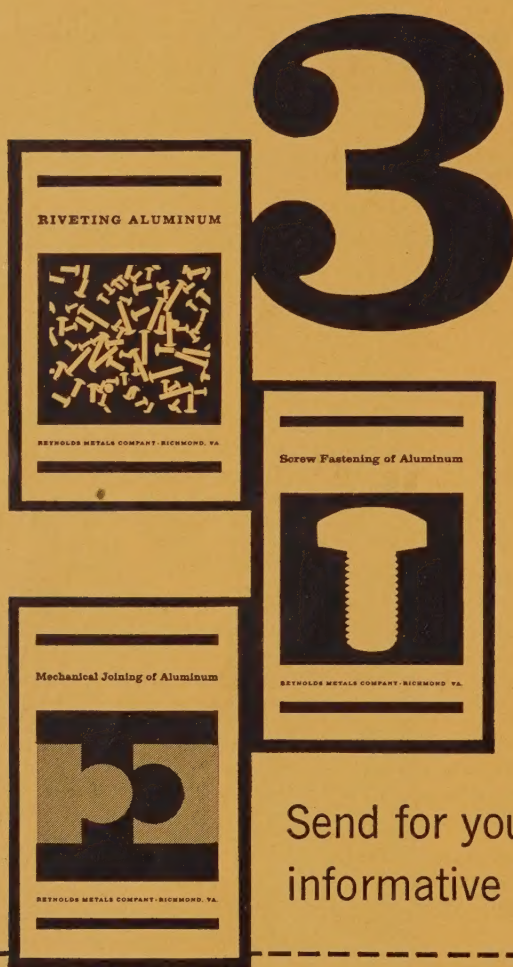
WRITE TODAY FOR NAMES OF LEADING MANUFACTURERS.

REYNOLDS ALUMINUM



Watch Reynolds new
TV show "Harrigan &
Son", Fridays; also
"All Star Golf",
Saturdays—ABC-TV.

a **luminum** fastening



**new Reynolds
Handbooks explain
and illustrate
various methods of
fastening aluminum**

These newest additions to the Reynolds Aluminum technical library belong in *your* library. All types of aluminum fasteners and fastening methods are covered in detail. Here is information that can help you select the most efficient, most economical method of solving your particular fastening problems.

Fully illustrated, these three books, plus the Reynolds handbooks on welding, soldering and brazing, offer you the most complete series on aluminum joining available.

Send for your free
informative booklets today!

Reynolds Metals Company
P. O. Box 2346-NL, Richmond 18, Virginia

Please send me the aluminum fastening booklets checked below:

- ☐ "Screw Fastening of Aluminum"
☐ "Riveting Aluminum"
☐ "Mechanical Joining of Aluminum"

Name _____

Firm _____

Street _____

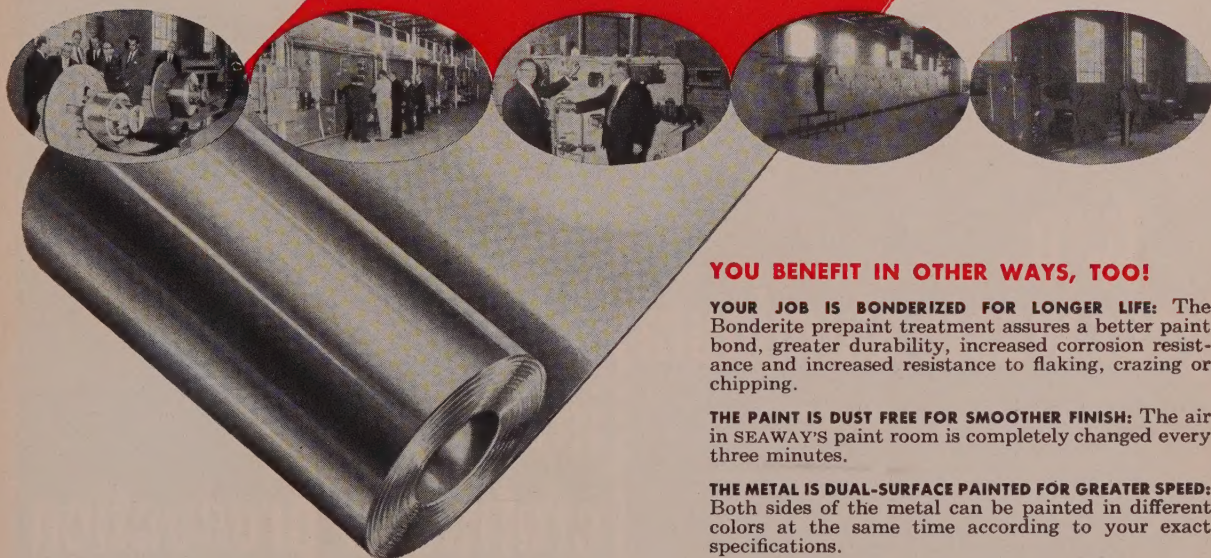
City _____ Zone _____ State _____



IT MAKES CENTS TO YOU
TO *Bonderize* AND
PAINT YOUR COIL AT
Seaway Products

You're money, time and service ahead when you deal with SEAWAY because we paint our own products! This may not make "cents" to you but the following will.

Our Modern high-g geared paint line out-produces our own products' forming equipment three to one. When we job paint your metal, we're merely utilizing idle capacity. We cut down overhead costs, you save money... it's as simple as that!



Don't Wait!

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MAIL THIS COUPON TODAY!



Seaway Products Division
of GLOBE INDUSTRIES, INC.
2207 Schrage Avenue, Whiting, Indiana

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Company _____

Street _____

City _____ State _____

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THE PAINT IS DUST FREE FOR SMOOTHER FINISH: The air in SEAWAY'S paint room is completely changed every three minutes.

THE METAL IS DUAL-SURFACE PAINTED FOR GREATER SPEED: Both sides of the metal can be painted in different colors at the same time according to your exact specifications.

WHAT'S MORE, we can paint acrylics, vinyls, alkyds or any modifications thereof; can roller coat widths of from 4 to 24 inches; aluminum thicknesses of from .010 to .050, steel from .006 to .040 and can handle any coil up to a 45 inch diameter or up to 4,000 pounds.

There is no newer equipment in the industry! You can't buy finer quality. And you get the fast, efficient service upon which SEAWAY customers have come to rely.

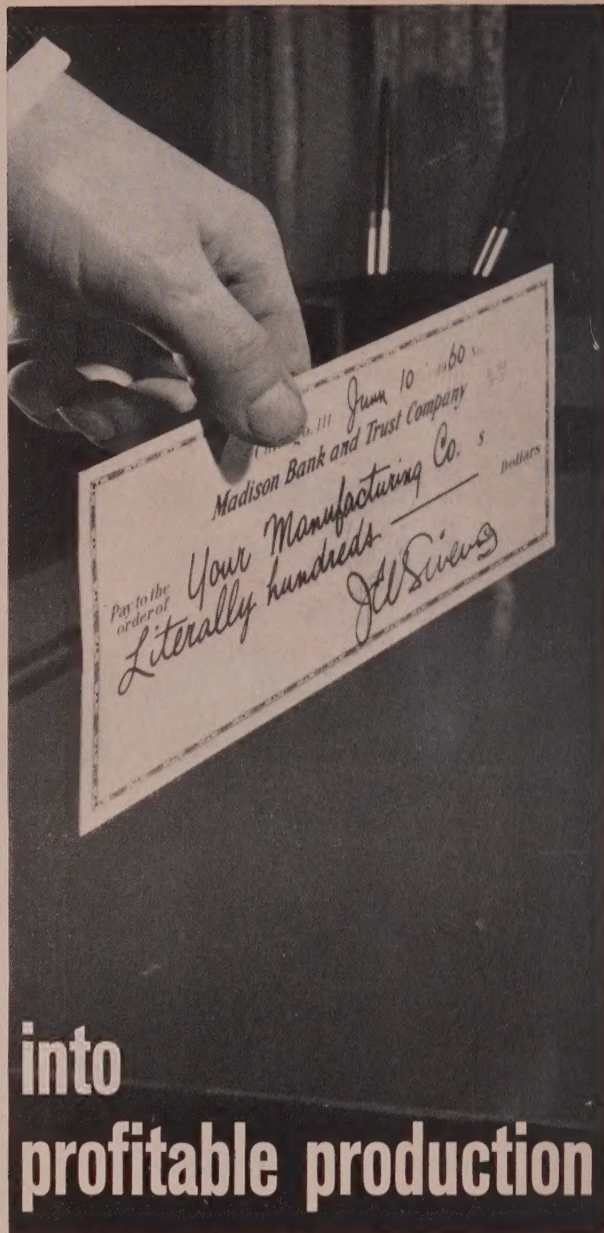
Why not let us bid on your next job. It can mean lower production costs and extra profits for you. Write, phone or send this coupon for further details.

Seaway Products

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Phone: Whiting 659-0295 • Chicago REgent 4-4400



turn
your waste aluminum



into
profitable production

You can eliminate scrap aluminum and start getting a *return* on the money, time and labor it took to produce this waste. The Ryerson Aluminum Sheet Plan makes exact lengths and widths available to most users—generally on a *net-weight basis*.

Order the exact sizes you need for production runs—Ryerson cuts them to size and schedules delivery to match your production-line pace. You save the cost of needless scrap, save the cost of cutting, save the cost

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At Ryerson you'll also find the widest selection of aluminum alloys, tempers and gauges—plus expert technical help on selection and fabrication problems. This is just one more example of Ryerson "Metalogics" and how it helps you get the most value for your purchasing dollar.

So be "Metalogical"—call Ryerson.

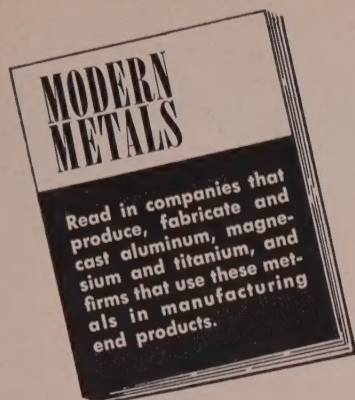


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Joseph T. Ryerson & Son, Inc., Member of the **INLAND** Steel Family

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Modern Metals

VOLUME XVI

JANUARY, 1961

NUMBER 12

ON THE COVER: Back in 1947 the residential aluminum siding business looked so promising that Jerry Kaufman set up a company to make the product. Today that company, Alside, Inc., is the kingpin in a burgeoning industry that should use up to 150,000 tons of aluminum sheet to make some 600 million square feet of aluminum siding annually by 1965. It's aluminum's fastest growing market, and Kaufman pioneered it. That's why we selected him as our 14th Light Metals Man of the Year. The story starts on page 44.

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Modern Metals has by far the world's largest circulation among light metals fabricators, foundries and product manufacturers who use aluminum, magnesium, and titanium. Circulation: Now over 15,000 copies per month. Acceptance under controlled circulation at Barrington, Ill.

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PUBLISHER W. B. GRIFFIN

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His Alside, Inc. helped start the aluminum siding business back in '47; still dominates industry that should use 150,000 tons of sheet annually by 1965.

ALUMINUM SHELTERS GAS STATION PATRONS 70

Circular canopy is dramatic example of aluminum's design versatility.

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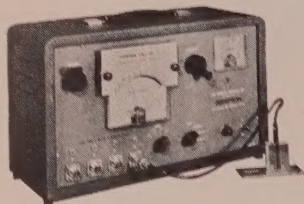
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ALUMINUM GAINS IN CAN MARKET K. B. Rhodie 84

Technological gains, super-salesmanship, commodity prices spur penetration of market for citrus juice cans. Gains also noted in oil, beer, food cans.

NEW!
DERMITRON
NON-DESTRUCTIVE
COATING THICKNESS
TESTER



**Measures coatings
 rapidly and accurately.**

Instantly measures the thickness of metallic and non-metallic coatings and films, such as **ANODIZING, PAINT, PLATING, HARDCOAT, ORGANIC FILMS, etc., on ALUMINUM, MAGNESIUM, TITANIUM** and all other metals.

Write for complete information.

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 ASSEMBLIES, INC.**



53-15 37th Ave., Woodside 77, N.Y.

Aluminum Smelting Plant

Specializing in the recovery of Aluminum Metal from Dross and Skimmings and the manufacture of Aluminum Ingots, and includes:

Real Estate, properly Zoned, Milling Equipment, Furnace, Laboratory, Railroad Siding, etc.

Price \$140,000—Terms, Owner has other interests.

For full details—write:

BOX 170

Modern Metals

435 N. Michigan Ave. Chicago 11, Ill.

EXTRUSION SALESMAN

Leading Southern aluminum extruder has excellent opening for salesman.

Man we need should be experienced in custom and restricted shapes, store fronts and architectural shapes. Write immediately giving details of experience, education and other pertinent information.

BOX 147

MODERN METALS
 435 North Michigan Avenue
 Chicago 11, Illinois

Letters

**For Spring, It's
 Chain Link Fence**

Sirs:

I have just read an article in the December issue of MODERN METALS entitled "Chain Link Fence—A fast Breaking Market."

We are manufacturers of chain link fabric. I would like to request permission to use parts of the article for some of our spring advertising.

"E"—Massachusetts

MM—The residential market for aluminum chain link fencing is quite new. It's off to a good start in 1961. Some predict that it may chew up 25,000 tons of aluminum this year; perhaps 130,000 tons by '65. Since most of the big chain link fence manufacturers are interested in aluminum, this market seems certain to develop into a live one.

You, suh, may make use of the article. If it helps your spring promotion program, don't thank us; just send a few miles of your chain link fabric or money—which ever is easier.

How Many Extruders

Sirs:

In your May 1955 issue, you gave the number of aluminum extruders. I would like to bring this up to date. If you could help me with this it would be a valuable assist in a research project that I am making.

Any information concerning extruders will be helpful.

"H"—Ohio

MM—Our last count added up to 120 companies that operate presses at 188 separate locations. But a couple recently went out of business (guess why), so make it 118 and 186.

A Commodity-Commodity Price?

Sirs:

It was certainly gratifying seeing in your December issue, in "Looking Ahead," your brief editorial covering aluminum distributors' concern about commodity prices.

It would be very surprising to me if all purchasers of aluminum were aware of the staggering number of commodity prices that exist in the aluminum industry, that we would not experience pure, unadulterated havoc as to whom is entitled to what price, at what time, and under what commodity.

I, for one, would like to see you investigate this matter further and give your readers a complete story in a full length article.

"J"—Pennsylvania

MM—To say that commodity prices for many aluminum products have gone beyond their original intent (to get aluminum's foot in new markets) is a classic understatement. (Jokes about undercutting aluminum commodity prices are getting all too common among certain segments of the purchasing fraternity—and they've ceased to be very funny.) The latest concerns weatherstripping which some comics currently call "door ingot."

What is so sick is that selling has become a secondary consideration among too many salesmen, to whom "selling" means offering the lowest price possible. One purchasing agent has renamed his office "Stealing Department."

Like water, this giveaway binge will seek its own level. We'll have a sadder but wiser

**Interested in
 Better Melting
 PROFITS?**

CALL

**WARWICK
 INDUSTRIAL**

FURNACE & ENGINEERING CORP.

452 W. Chicago Ave. Chicago 10, Ill.
 Phone SU 7-7664

**Machinery Sales
 Firm Seeks
 Equipment Lines**

We want to represent in the U.S., on an exclusive basis, USA or Canadian manufacturers of machinery, equipment or processes for light metal fabricators and container manufacturers.

We are now, and have been for several years, the exclusive U.S. sales agency for a leading manufacturer of specialized machinery serving the light metals industry.

Also interested in additional foreign lines.

Send complete details to:

BOX 1110

Modern Metals
 435 N. Michigan Ave.
 Chicago 11, Ill.

Now!
you can lease
ROLITON



Revolutionize the Siding Industry!

Produce your own
ALUMINUM SIDING
 and cut it to fit **AT THE JOB!**

Without Buying Costly Equipment!

Look at the customer advantages—

- No delay in installation
- Choice of 7 baked-in pastel colors
- Durable, attractive, effective seamless finish
- Insulated comfort year-round.

If you're interested in making more aluminum siding sales easier, more profit faster . . .

CLIP THIS COUPON AND MAIL IT NOW!

- A *leased* portable Roliton system gives you these special advantages as a building supplier-contractor:
- Form standard 8" siding at the job from pre-stressed rolls any length or shape as it is formed.
- Roliton minimizes waste, reduces installation costs.
- Transport Roliton equipment easily from job to job.

ROLITON CORPORATION

1600 Ogden • Denver 18, Colorado • Department / MM

Please send me literature on Roliton system and leasing arrangement.

- ☐ I would like to see the Roliton system demonstrated.
- ☐ I would like further information about Roliton automatic roofing equipment.
- ☐ I would like a Roliton representative to call on me.

Name _____

Title _____

Company _____

Address _____

City _____ State _____

Used Extrusion Press Wanted

Wanted: Used aluminum extrusion press,
1000 ton capacity.

Box 133

MODERN METALS
435 North Michigan Avenue
Chicago 11, Illinois

ALUMINUM REDUCTION

A most unusual opportunity for a competent technical man, thoroughly experienced in the complete operation of vertical stud Soderberg anode cells. The man selected must have an outstanding engineering record, a theoretical knowledge of this electro-chemical process, and extensive operational experience producing primary aluminum. Must be capable of quality inspection of actual operations. Excellent salary, major benefits. Detail your background and experience in strict confidence.

HARVEY ALUMINUM

Attn: Director of Professional Personnel
19200 S. Western Avenue Torrance, California

MAINTENANCE MAN

with eye to production. Excellent future, excellent opportunity for top flight mechanic and machinist who can establish effective preventive maintenance program to assure full production on tube drawing equipment. Must be good at jigs and fixtures and ideas to help production.

Starting salary \$7,500 to \$10,000 per year. Located North Adams, Massachusetts.

BOX 101

MODERN METALS

435 North Michigan Ave., Chicago 11, Ill.

puzzled ?
about cleaning or
finishing aluminum

Get a copy of "How to
Clean and Finish Aluminum"

Use order form on page 59.

industry when the tide turns. And it may come sooner than we think.

Porous Sheet

Sirs:

In your "Letters" section of the October, 1960 issue, you published a letter from "J"—California, asking about porous metal in sheet form.

We have been working on a cast porous metal product having continuous, uniform pores. Pore sizes can be varied from 2 mesh or larger to about 60 mesh. The product is amenable to most of the standard processing techniques. While most of our work has been with aluminum and magnesium, we could produce this product in any metal having a melting point less than 800°C.

Enclosed is a sample of porous cast aluminum. We would appreciate your forwarding the sample and one copy of our correspondence to "J"—California. If he is interested, please have him contact us.

"K"—Michigan

MM—Sample has been forwarded, and we're sure reader "J" is grateful.

New Facilities For New Product

Sirs:

We have developed and are ready to put into production a new product for which we need 2" x 4" hollow aluminum shapes. We plan to market it in key areas throughout the country.

Can you supply us with names of manufacturers in the major trading areas who are equipped to do this type of work? They should also have anodizing and buffing facilities.

"W"—Georgia

MM—Can we ever! We've sent you a list of the best extruders in the world. Fact is, our Light Metals Buyers Directory will be published next month, and will list not only major extruders, but sheet mills, equipment manufacturers, firms who do fabricating and anodizing, and you name it.

Wants Roll-Up Aluminum Ladder

Sirs:

After an exhaustive search through our clipping files on fabricated aluminum items, we have not been able to find the manufacturers of a flexible aluminum ladder that can be rolled up for storage. We do know that such an item exists, and it is available in the United States because we have seen photographs of it in the trade press.

"D"—California

MM—Such a ladder doubtless exists, but we've never seen one—except the rope or vine type, that is. On second thought, we've seen the odd aluminum ladder that was almost thin gauge enough to roll up like a hose.

Can any reader help "D" of California?"

Aluminum and Railroads

Sirs:

We would appreciate your forwarding one copy of the MODERN METALS reprint, "How Aluminum Will Serve the Railroad Revolution."

We are very interested in this article and would appreciate your early attention to the above request.

"V"—Maryland

MM—This was a major, and, we believe, important survey of what the railroads think about using aluminum. For one thing, it turned out much more bullish than we had anticipated; found much interest by suppliers and carriers alike.

A reprint has been sent.

NEED NEW BUSINESS?

Lots of new business from light metals fabricators and product manufacturers is obtained through half-column advertisements like this one.

And the cost is sure low—only \$70 per insertion on an annual basis.

Want details? Write Paul Messer, Modern Metals, Tribune Tower, Chicago 11, DE 7-0638.

BILLET FURNACE FOR SALE!

One Granco 4-stage gas fired billet furnace to heat 6" to 9" die billets. For full particulars contact:

CANADIAN MOULDINGS LIMITED
CHATHAM, ONTARIO

SALES REPRESENTATIVES

Territories available in Midwest, South, West Coast.

Must have background in aluminum sales. We are processors of anodized aluminum in coil (see ad, this issue). Send full details to:

William Rusch
Rusmar Processing Company
212 Northwest Highway
Fox River Grove, Illinois



Contact General...

...FOR SPECIAL EXTRUDED PARTS AND NEW DEVELOPMENT...

General Extrusions, Inc., is geared to accomplish the near-impossible in terms of rapid production and delivery. G.E.I. engineers are constantly searching for new standards and improvements, new ways to save the customer time, material and money. Whatever your needs, it will pay you to contact G.E.I. Even before your requirements are definitely established in the case of new parts development, G.E.I.'s engineering department is at your disposal for consultation, without obligation. For certain needs, G.E.I.'s customers send their own aluminum parts in for a single operation—to be anodized, machined, finished or for additional fabrication. The following special contract services are available from G.E.I.: round tube and rod polishing by special machine, mitering, punching, slotting, drilling, forming, milling, bending, blanking, assembling and packaging.

No Price Penalty on Small Orders

...FOR STANDARD EXTRUDED SECTIONS...

OVER 500 STOCK DIES READY TO FILL YOUR NEEDS

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|-----------------|-----------|------------|------------|
| • Trim Sections | • Rounds | • Channels | • Angles |
| • Flats | • Squares | • Tubing | • T-Shapes |

You incur no die costs when standard dies are used. General's hi-speed service applies here . . . one week to ten-day delivery maintained.

**ANODIZING BY GENERAL INCLUDES ANY SPECIAL COLOR
SUBJECT ONLY TO VOLUME ORDER LIMITATIONS**

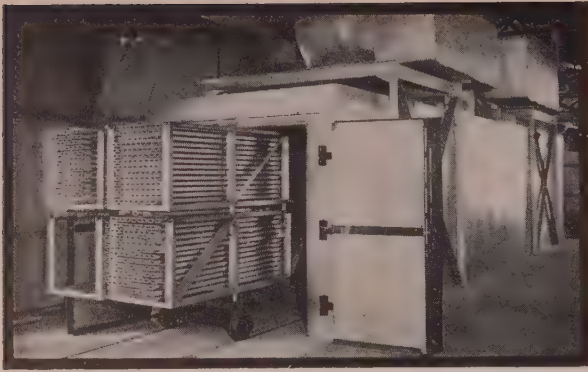


GENERAL EXTRUSIONS, INC.

4040 LAKE PARK ROAD • YOUNGSTOWN, OHIO • Phone STerling 8-9681

Sales Offices at St. Louis, Cleveland, Pittsburgh,
Cincinnati, and Chattanooga

Consult your classified phone book under Aluminum Products



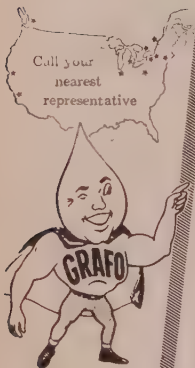
carl mayer Designs and Builds Better ALUMINUM Extrusion AGEING OVENS

This truck type oven is now in service at Penn Extrusion Corporation, Erie, Pa. Close temperature control is maintained through the use of two gas fired, recirculating air heating systems. Other Carl Mayer design features assure trouble-free, economical operation. Write for Bulletin HT-53.

THE carl mayer CORP.
20800 CENTER RIDGE ROAD, CLEVELAND 16, OHIO

OTHER PRODUCTS: Core & Mold Ovens • Rod Bakers • Paint and Ceramic Drying Ovens • Special Processing Equipment & Accessories

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& Sales Ltd.
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Rexdale, Toronto, Ont.

Any of these sales representatives will gladly help you with your own lubricating and related problems, and prove to you the value of GRAFO Colloidal Dispersions for improving production and reducing cost!

Send for booklet, "The Biggest Ounce of Protection"



GRAFO COLLOIDS Corporation
259 Wilkes Place, Sharon, Pa.

Here and There

Mobile Market » » Both Reynolds Metals and Kaiser Aluminum recently came out with news releases concerning the mobile homes industry. Their estimates of amount of aluminum used differ somewhat, but both producers believe their metal is making a comeback in this growing business because of the availability of pre-enameled sheet. Reynolds figures on aluminum being the major material in 90% of the 120,000 mobile homes to be built this year, generating a demand for 24 million pounds of prepainted sheet. Kaiser also expects 90% of the mobile homes built in '61 to be made mainly of aluminum, but sees this as amounting to a demand for some 42 million pounds of aluminum. Kaiser went a step further, predicting shipments of 52 million pounds of aluminum to this industry within three years. Mobile homes accounted for 14% of all new housing starts in 1960—up from 12% the year before, says Kaiser. The Mobile Homes Manufacturers Association estimates shipments at about 100,000 units in '60—14% under the 1959 total. Shipments of travel trailers last year held their own at 42,000 units, says MHMA. Aluminum was doing well in the business until a few years ago, when prepainted steel began to move in. But with the increased availability of prepainted aluminum, the market is returning to aluminum. Maybe it will stick this time.

Wood Still the King » » Last year about 7 million windows were sold throughout the country—probably less than in 1959 and 1958. Back in 1957 close to 5½ million windows were sold in a year when the building business was considered good. More vim will have to be injected into the building field if the figure is to approach 7 million this year, as some predict—unless the aluminum frame should make quick inroads into the wood window business. Probably half of all windows made—private or industrial—are wood, while 2% are steel. How can aluminum manufacturers increase their share of the market? The addition of color will help but this is limited as long as price competition remains so fierce. It costs a few extra dollars to anodize or paint a window, and most builders and contractors still are not sold on the advantages of color. Wood windows are sold in the natural color and simply painted along with the house. But if and when the aluminum siding business becomes big enough, so that most homes would require little, if any, paint, then the idea of pre-painted windows, doors and screens might be easier to sell.

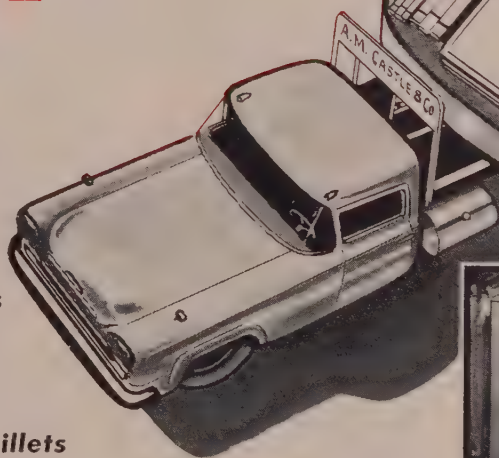
Windows and Doors Booming! » » Down in Florida nearly every aluminum window and door manufacturer thinks that the soaring '60's will bring substantial gains for the business; that the industry has reached maturity and can take advantage of growth. Daryl Industries says that the industry never had such opportunity to manufacture and sell quality products in quantity at a sensible profit. Arnold Altex increased prices 10% last year, says it restored profit margins which had deteriorated to the bare minimum. Yale

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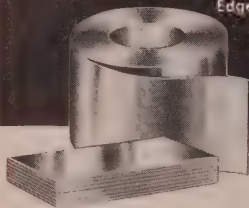
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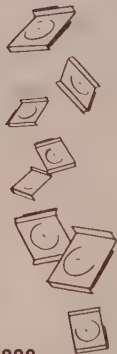
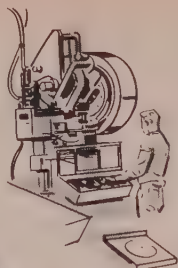


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Manufacturing is increasing sales at the rate of 30% this year, expects increases to continue for 10 years. Pan American Windows expects to increase sales 25%. Rusco Windows says private and public construction is high, and need for more and more construction continues. The Florida Aluminum Window and Door Association forecasts an ever increasing use of aluminum; a rising standard of quality; and a firming up of prices, with the decade ahead being the most profitable for aluminum window makers. This industry in Florida sells \$150 million worth of these products a year; has a payroll of nearly \$50 million. If these prognostications are correct, then either Florida hasn't felt the housing slow-down, or all manufacturers who make these products outside of the state of Florida are missing a helluva bet. We'd like to believe that there is no problem connected with aluminum windows and doors — but we can't.

The Casting Business » » The aluminum casting industry — 3200 sand, die and permanent mold firms — generally had a poor year in 1960. Figures for total shipments will not show this because of the hot metal contracts of some auto makers, which started large volume usage of castings last year. A lot of foundries and some die casters went out of business, simply because there wasn't any business for them — and still no upturn in sight. Casting plants are buying hand-to-mouth, waiting for the upturn which may never develop. Strangely enough some of the larger foundries and die casters are extremely bullish about their business prospects over the next five years. Many of them even talk of boosting their business 50 to 100%. Some of them can point to new uses, but we suspect that too many of them are transposing automotive estimates for the future to their own sales charts. Up at GM research, the common talk is that the average automobile will be using over 150 pounds of aluminum castings within a couple of years. In a 6-million car year that would add up to nearly a half a million tons of aluminum. Many a foundry believes it will get a fair share of this increased business, but auto companies are adding facilities to make their own castings. So what's the future for the small foundryman or die caster? Some say: Stick to the small jobs; the tough jobs; be sure you have a good tool and die department; don't bid on jobs just to keep the shop going; and hire and keep good sales engineers who can help a user in his own plant. They should add: If you run a foundry or die casting shop, know how to run every department and every operation. The successful plants we have visited are run by people who have intimate knowledge of everything that goes on in the shop.

Siding Sales Soaring » » According to Gordon C. Estes, retiring president of the Aluminum Siding Association, his industry racked up a 20% gain in sales last year, with "not less than 10%" of the material going into new construction. Estes expects new homes to take 15% or more of the total in 1961. His estimates are pretty close to ours (see article on page 44), but he did not hazard a guess on this year's sales. We look for sales to jump about 12% to 195 million pounds.

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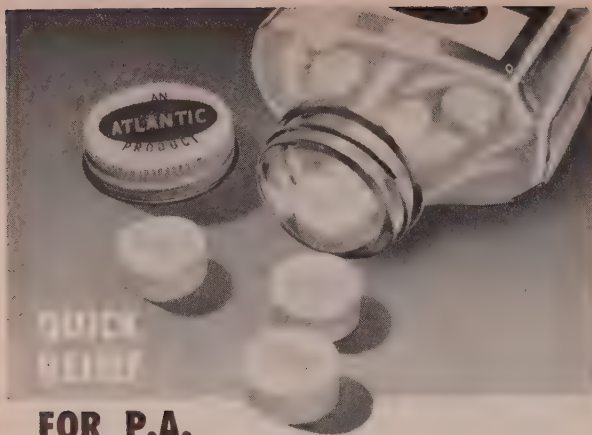
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New Enterprise

A slide film projector and a two-speed high-fidelity phonograph have been combined into a 10½ pound package cased in aluminum. Dukane Corp. of St. Charles, Ill., has fabricated the inside of the case so it can be used as a screen for showings to very small groups.

Two factories, one for the manufacture of precision machine tools and dies, the other to produce aluminum products, including automatic vending machines, are being built by Orit-Israel Corp., wholly-owned subsidiary of Dwyer-Baker Electronics Corp., Miami, at Kiriattgat in Israel's Negev desert. Both buildings are now under construction; are expected to be in production by year's end.

A midget cooling blower is constructed entirely of aluminum by Torrington Mfg. Co., Specialty Blower Div'n, Torrington, Conn. Unit is less than 3 inches wide, is 3½ inches high, 3½ inches deep, and weighs only ½-pound. It has a 60 cps motor, is rated at 12 cfm at 3600 rpm. Blower has static pressure of 0.20 inches of water.

A new single stand, 77-inch four-high rolling mill, and a two-stand 77-inch four high tandem mill were to have been installed this month at Fairmont Aluminum Co., Fairmont, W. Va. Loewy-Hydropress supplied the units.

Electric Autolite Co., Toledo, has stockholder approval to acquire Hiller Aircraft Corp., Palo Alto, Calif., helicopter manufacturer. To effect the acquisition, Autolite will offer a stock exchange, with one of its common shares going for four and a quarter Hiller shares.

Aluminum safety treads which fit over existing stairs are being produced by Wooster Products Inc., Wooster, Ohio. Each stair tread is designed to be placed over worn stairs which, especially in industrial areas, could cause accidents. Spaces between aluminum ribs are filled with an abrasive.

Aluminum tubing is combined with a plastic-coated fabric by Orthopedic Frame Co., Kalamazoo, Mich., to make a first-aid stretcher. The unit minimizes patient handling because it can serve as examining, treating, and x-ray table. Stretcher weighs 29 pounds, has side rails and wheels.

High-level outdoor lighting units, such as needed in parking lots, add to the attractiveness of the area if selected from a group of aluminum standards produced by Line Material Industries, Milwaukee 1, Wis. Lights come in natural aluminum finish or in five pastel colors.

A cabinet which can be used to keep food chilled or warm while being transferred from kitchen to serving area is being made of aluminum by Foster Refrigeration.

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ALUMI-GARD No. 103

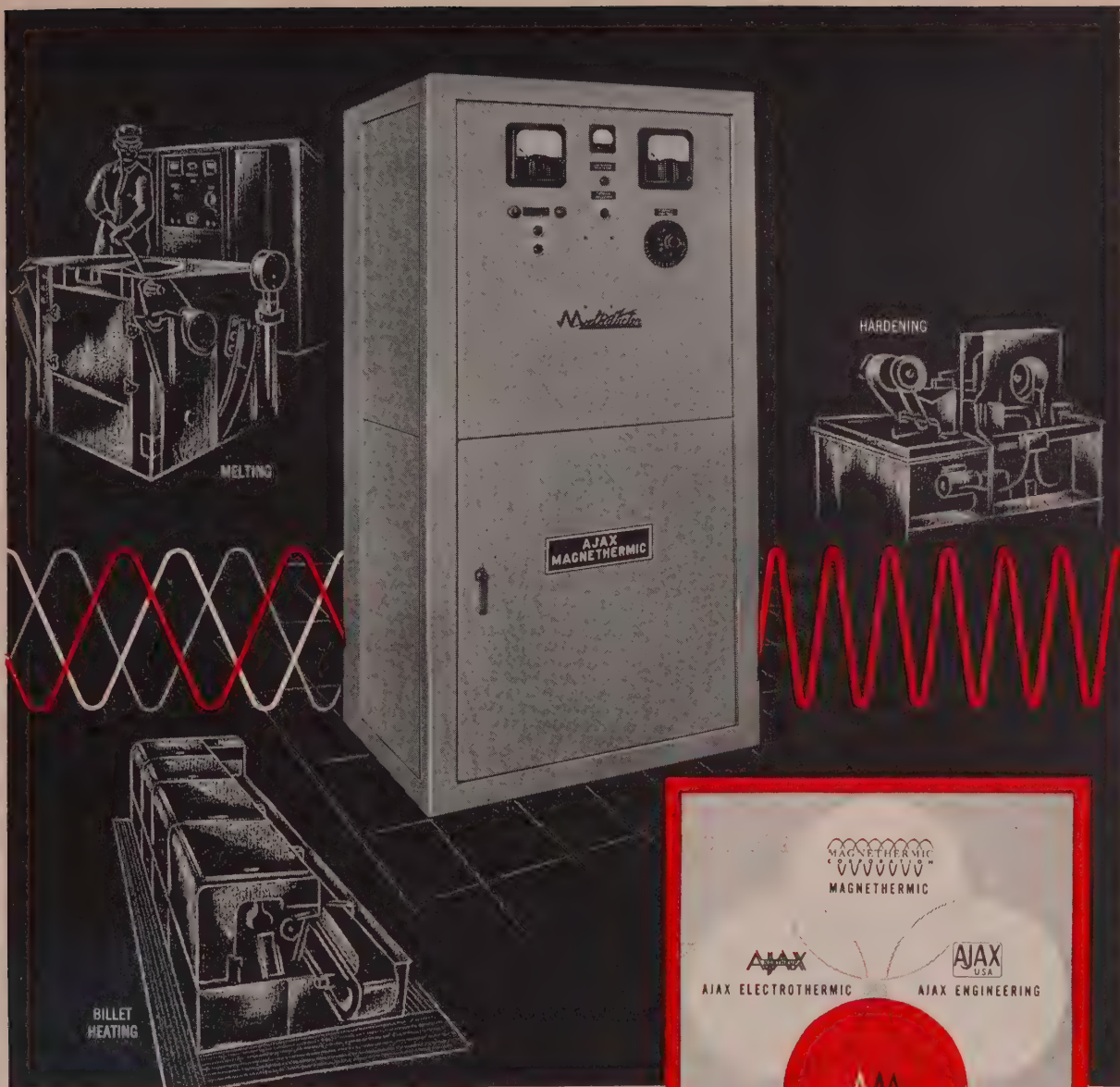
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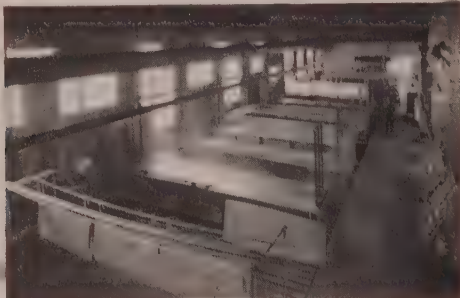
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tor Corp., Hudson, N. Y. Used for mass feeding establishments, the cabinet offers a temperature variance of from 38°F to 220°F.

Automotive engine part manufacture and assembly will be expanded by Chevrolet Motor Division in Tonawanda, N. Y., after the firm completes its purchase of a government owned aviation engine plant in that town. Legal technicalities on the 75,000 square-foot structure are now being worked out. The plant will be under the jurisdiction of Leonard F. Coyle, recently appointed manager of Chevrolet-Tonawanda.

A double-acting power cylinder made by Galland-Henning Nopak Division, Milwaukee 46, is encased in an aluminum extruded square barrel which offers mounting flexibility. Cylinders come in ¾, 1, 1½, 2 and 3-inch diameters. Heads and head plates are die cast aluminum, piston rod is stainless steel.

Walkways, service and parking areas can be sheltered by specially designed structural panels roll formed by Navco Inc., Dallas, Texas. Panels are of 0.025 and 0.036 aluminum, either enameled or standard mill finish. Fascia is extruded aluminum with integral gutter.

A hammer with an aluminum head and soft face will not damage machined surfaces. Other advantages: There is practically no rebound; head is non-sparking, and non-spalling. Frank N. Wood Co. makes these claims and hammers in Waukesha, Wis.

An elegant way to finish off a new building or to perk up an old one is to identify it with cast aluminum letters with either a polished or satin finish. H. W. Knight & Son, Inc., Seneca Falls, N. Y., makes the letters in six styles and in wide range of sizes. Special designs are made to specification.

A treaded aluminum dockboard with a capacity of 8000 pounds has been tested and is being marketed by Gate City Steel Inc., Omaha 1, Neb. Dockboards are supported by a structural aluminum angle which locks the plate securely between dock and truck. The 51-pound dockboards are 30 by 48 inches.

A long-reaching aluminum boom has expanded the self-unloading operation of the "J. R. Sensibar," Great Lakes vessel owned by Oglebay Norton Co.'s Columbia Transportation Division. The boom, fabricated of extruded shapes, is 256 feet long, 60-feet longer and 25 tons lighter than the steel boom it replaced. Christy Corp., Sturgeon Bay, Wis., constructed the boom.

Specialty forming, joining and machining of tantalum, molybdenum and tungsten are being added to the specialized operations of Astro-Fab Inc., Wooster, Ohio. In announcing expansion plans, firm president P. F. Ziegler said: "We believe that the chemical, electronic and missile industries will find increasing uses for titanium, tantalum, molybdenum . . ."

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CHEMICAL FINISHING OF ALUMINUM

anodic coating - anodizing - chemical conversion coating - phosphating - conversion coating - phosphating - conversion coating - anodizing - bright dipping - bright and German anodizing methods - thermal anodizing.

ANODIZING - PLATING ALUMINUM

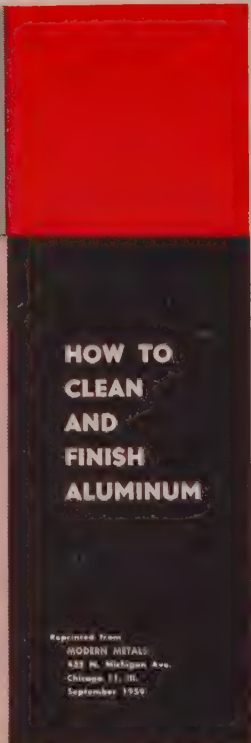
parameters - standards - coating characteristics - operation, maintenance - color - anodizing - sealing - hard coating - bath or solvent - electroplating - special considerations - plating methods - electroplating processes.

ORGANIC COATINGS FOR ALUMINUM

cleaning methods - surface preparation - primers - each type primer - types of finishes - spray painting - fast drying spraying - solvent vapor-resistant spraying - stress cracking - roller painting - dip painting - film coating - baking - drying.

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1-61

Alodine protective coatings for aluminum products are detailed in Amchem fact sheet for your quick reference. Booklet includes general description of Alodine, a selection chart and coating characteristics such as composition, coating weight, solubility, heat stability, corrosion, impact and salt spray resistance, etc. Also given are results of accelerated salt spray, impact, and bend tests on Alodine treated aluminum. Write to J. D. Breen, Amchem Products Inc., Ambler, Pa.

Interested in refractory products such as tubes, tap hole plug cones, pouring basins and spouts, floats, and others? If so, Refractory Products' new Form 2 will fill you in on such details as K values, chemical analysis of fiber, dimensions, and applications. Special and standard shapes pictured are said to be resilient, good insulators, and to resist wetting by aluminum. For booklet, write E. E. Woodruff, Refractory Products Co., 910 Custer Ave., Evanston, Ill.

Your questions about hand spray painting and the equipment needed may be answered by Binks' 72-page catalog 956. Detailed information is provided on the following: Spray guns, extensions and attachments; nozzles; cups; oil and water extractors; respirators; hose and connections; agitator units; compressors; circulating systems and pumps; spray booths; air supply systems, etc. Write J. Rowe, Binks Mfg. Co., 3124 W. Carrol, Chicago 12.

Need information on titanium racking systems for anodizers and electric polishers? Servi-Sure's 1960 catalog covers disc, box and clip racks, showing applications of each, dimensions and price. Smaller, standard racks pictured include doublet and star fishbone types, and standard and modified utility units. New book can be obtained from Ernie Rosner, Servi-Sure Mfg. Co., 131 N. Green St., Chicago 7, Ill.

Vapor recovery systems claimed to cut your degreasing solvent cost by 50% are subject of new Vic book (Form 229). Capacities of 11 models range from 700 cfm to 5500 cfm. Other data include motor and boiler horsepower, inlet and exhaust duct dimensions, and water, steam and solvent line statistics. Operating principle of system is described and advantages are listed. For copy, write Vic Mfg. Co., 1313 Hawthorne Ave., Minneapolis 3, Minn.

Heat treating furnace and oven installations of Carl Mayer are covered in bulletin HT-53. Furnaces shown include car bottom, batch, conveyor, special and pit types. Photographs and diagrams are used to explain operation. For copy of booklet, contact C. F. Mayer, Jr., The Carl Mayer Corp., 20800 Center Ridge Road, Cleveland 16, or call at ED. 3-0833.

A slide rule guide to tool steels is being offered by Universal-Cyclops Steel. Indicated are 600 brand names,

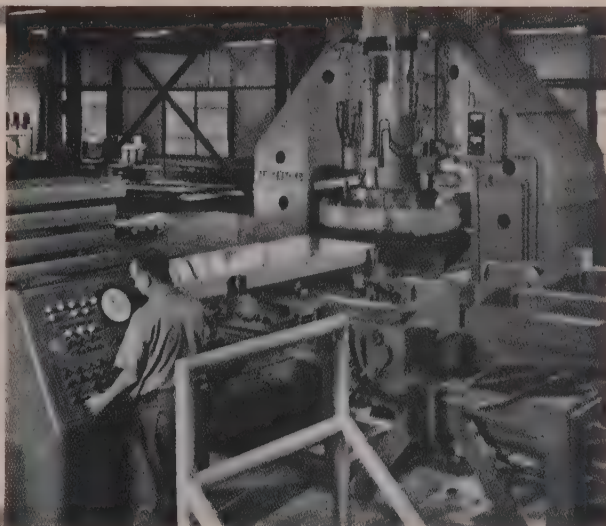
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producer, AISI number and U-C equivalent brand. Brands and AISI types are listed alphabetically and numerically. Classification table shows chemical composition and AISI designations for water hardening, shock resisting, cold work, hot work, high speed and special purpose tool steels. For your slide rule write Robert Stevick, Universal-Cyclops Steel Corp., Bridgeville, Pa.

Need information on **aluminum casting alloy ingot**? If so, Alcoa's new 12-page brochure will help you out. Tables show sales composition limits on 29 casting alloys, 16 rich alloys, and tabular information on suggested uses, properties, characteristics, and recommended thermal treatment of alloys. For booklet 28-11410, write Aluminum Co. of America, Alcoa Building, Pittsburgh 19, Pa.

If you're interested in **tube mill equipment**, write for Yoder's new edition of booklet 727-2M. Part 1 discusses the profitability of installing a tube mill, the tube making process, physical requirements of tube used in various industries, and supplementary mill equipment. Part 2 gives engineering data and specifications on all equipment needed. For copy, contact R. L. Burt, The Yoder Co., 5500 Walworth Ave., Cleveland 2, Ohio, or call at ME. 1-0520.

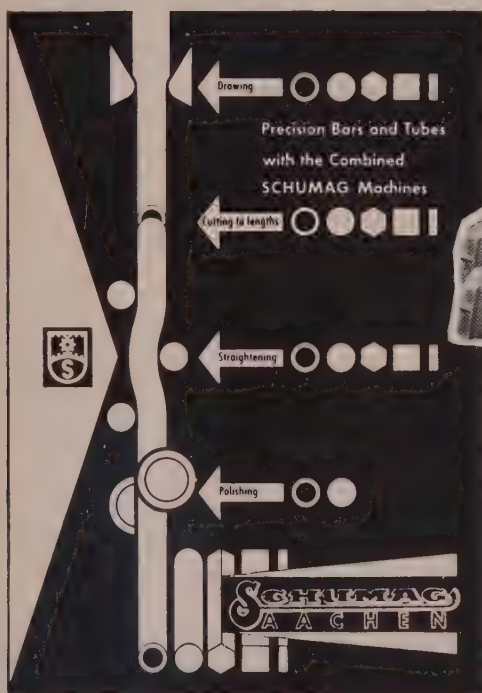
Sheet metal roller leveler bulletin 1959, by F. A. Woehr, covers four models of levelers, all of which have power driven rolls and operate at a standard speed of 60 feet per minute. Specifications given for all models include number of straightening and feed rolls, their diameter and length, overall dimensions of units, and motor horsepower. For copy, write to K. F. Woehr, F. A. Woehr Machine Corp., 17 Favor St., Rochester 8, N. Y. Phone: LO. 2-6475.

Paint finishing systems and component units are detailed in bulletin PF-400 by J. C. Ross Engineering. Booklet includes a pictorial story of the finishing line; illustrations, descriptions and technical data of the individual component parts; construction and conveyors. One section is on the Ross-Waldron strip coating line, metal decorating units, and the firm's laboratory facilities. Copy can be obtained from R. G. Hentschel, J. O. Ross Engineering Div'n, Midland-Ross Corp., 730 Third Ave., New York 17, N. Y.

Would you like to know about a proprietary high-strength **aluminum casting alloy** which ages at room temperatures, yielding mechanical properties equivalent to heat treated alloys? Federated Metals will send you brochure 103 R 5 describing Tenzaloy, an aluminum-zinc-magnesium alloy which develops tensile strengths of 35-40,000 psi without heat treatment. Booklet lists specifications and nominal composition, tabulates physical and mechanical properties, and gives details of casting methods, dimensional stability, corrosion resistance, machineability and welding, brazing and plating techniques. For brochure call E. Friedlander at RE. 2-9500, or write Federated Metals Division, American Smelting & Refining Co., 120 Broadway, New York 5.

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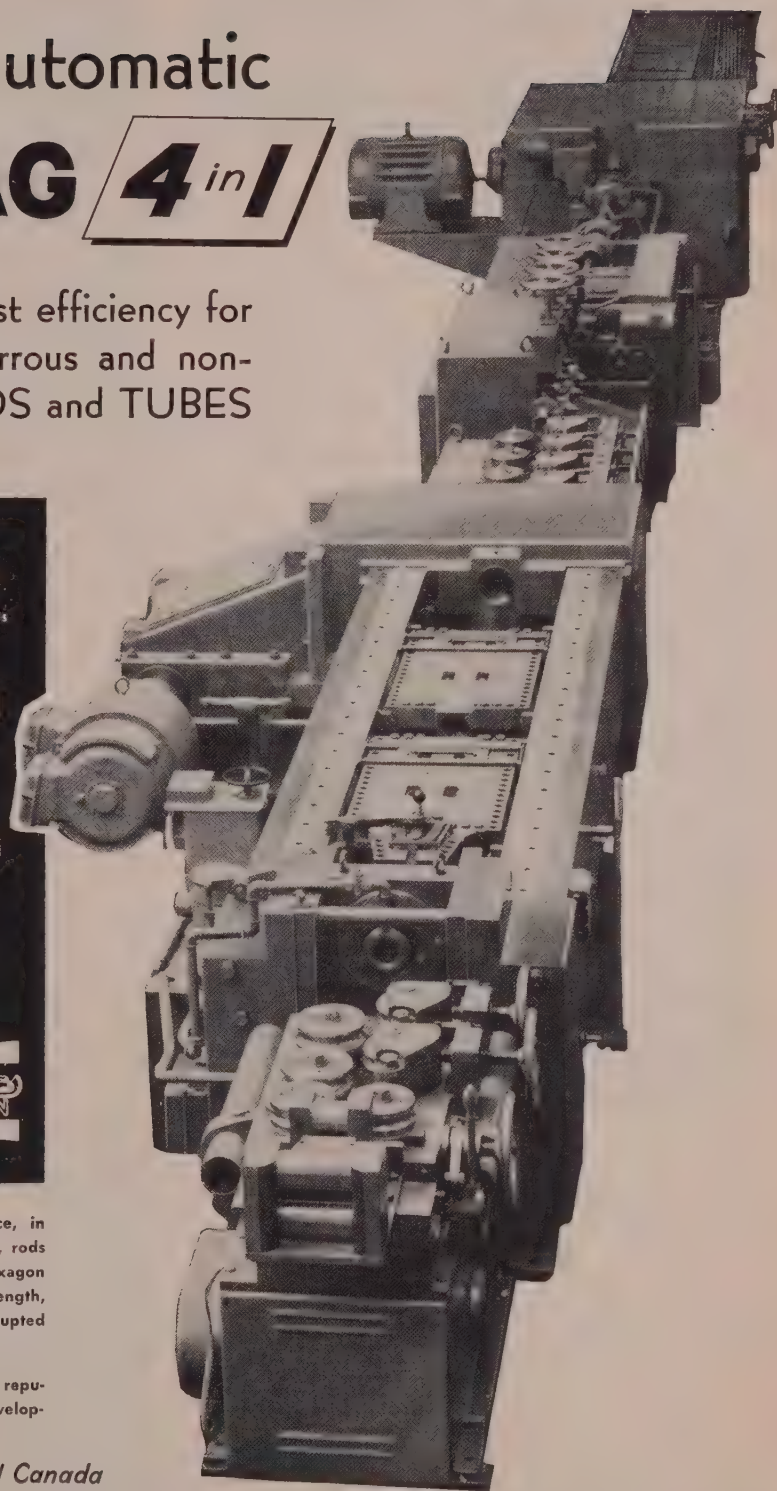
- SCHUMAG "4 in 1" machines produce, in one continuous operation, finished bars, rods and tubes from round, square or hexagon material. They will finish draw, cut-to length, straighten and polish in one uninterrupted sequence.
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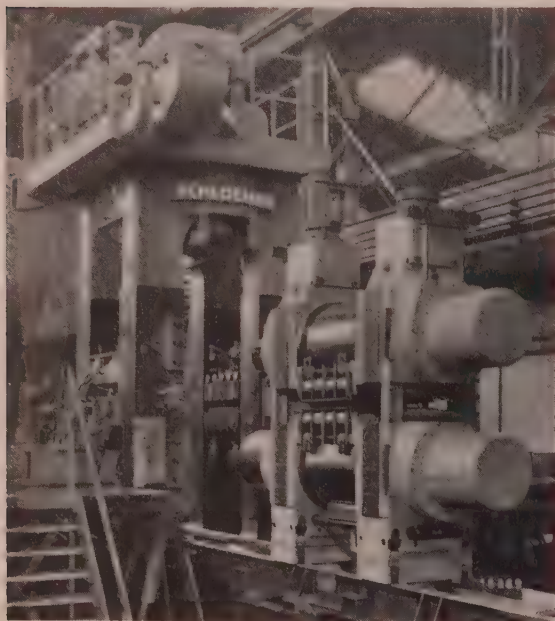




SCHLOEMANN
ROLLING MILLS HAMMERS PRESSES

Multi-purpose rolling mill for "refractory" materials

Special alloys for the nuclear power and other industries have presented extraordinary problems. The new MKW mill (US and foreign patents) developed by SCHLOEMANN is ideally suited for rolling these refractory materials and is readily adaptable

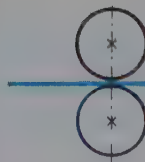


MKW 80 during workshop assembly. Above, the double MKW set-up is seen in run-out position; below, the view from the entry side shows the pay-off reel and coiler.

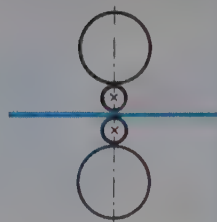
for conventional rolling work. Typical characteristics as included in the specifications of an MKW mill recently built for operation in the United States are as follows:

Hot and cold rolling – Initial thickness up to 2"
Final thickness of strip – .006" standard; .001" min. Rolling force – in excess of 2200 tons at 24" strip width (twice the roll separating force required for rolling of conventional CrNi steels).

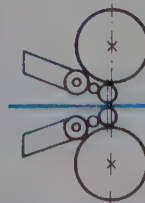
Two-high



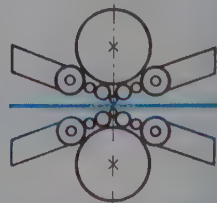
Four-high



MKW



Double MKW



16277

Four different roll set-ups for one mill:

Two-high set-up: 36" $\varnothing$ rolls

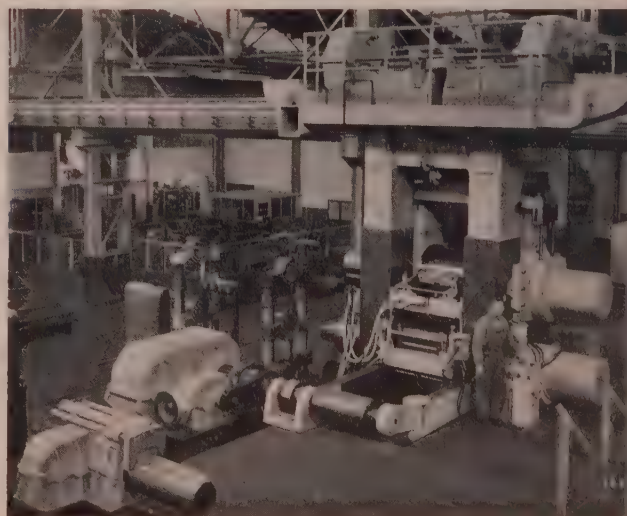
Four-high set-up: 16 1/2" $\varnothing$ driven work rolls

MKW set-up: 36" $\varnothing$ driven back-up rolls,
5" to 5 1/2" $\varnothing$ work rolls

Double MKW set-up: 36" $\varnothing$ driven back-up rolls,
2" to 2 1/4" $\varnothing$ work rolls

Wide working range

The mill is equipped with four different roll set-ups and is thus provided with an extremely wide working range. Since the new super high-grade but difficult-to-work materials are currently required in comparatively small quantities only, the use of one MKW mill with four different roll set-ups offers practical and economical advantages.



FASTENING ALUMINUM

● Part One of Modern Metals' special series on fastening aluminum presents: General discussion of fasteners; comparison of joining methods; results of survey of fastener users; history of aluminum fastening industry; selection and heat-treatment of fastener alloys.

● Next month, Part Two will cover permanent fastening — detailing all facets of riveting and metal stitching.

● In subsequent months, semi-permanent and the more commonly used special fasteners will be detailed.

DESPITE impressive technological strides in welding, brazing, soldering and adhesive bonding, the most commonly used means of joining most structural materials is mechanical fastening. This is as true of aluminum as it is of other nonferrous metals, the ferrous alloys, and non-metallics such as wood.

Perhaps the most outstanding feature of mechanical joining is the broad diversity of processes available. The manufacturer has an almost bewildering choice of methods and materials, ranging from simple mechanically formed joints such as the lock seam used by sheet metal shops, to elaborate assembly techniques employing sophisticated special fasteners.

This diversity also extends into the realms of cost, speed of production, tolerances, mechanical properties, and other vital factors.

Mechanical fastening may involve one of the cheapest joining methods—or one of the costliest. It can be a slow, laborious task—with some threaded fasteners, for example—or an ultra-high speed process such as stitching or automatic machine riveting.

Joint tolerances may be very high with certain types of screw machine fasteners, or on the low side when stitching or riveting. Bolts may produce the strongest assembly possible, while stitching is usually recommended for lightly loaded joints.

The classical division of mechanical fastening into two categories—permanent and semi-permanent—is convenient, but perhaps too rigid to accommodate all types of fasteners. Permanent fastening is best exemplified by riveting. Disassembly would usually involve destruction of the fastener, if not the product itself. An aura of permanence may also surround, say, a sheet metal assembly held together by several hundred tough wire stitches.

But if the same product were joined with a smaller number of sheet metal screws, for example, disassembly could be a comparatively simple procedure. This is one obvious distinction of semi-permanent joints made with threaded fasteners such as screws, bolts, nuts, etc.

But semi-permanence is not necessarily a functional distinction; most joints, whether made with threaded fasteners or with rivets, are not designed for disassembly. If a temporary joint is wanted, any number of quick-release fasteners are available.

The difference between permanent and semi-permanent becomes less distinct when considering other types of fasteners. In fact, some products that are classified as fasteners perform only an auxiliary function. Some washers, retaining rings, and inserts, for example, only assist in the fastening operation, be it permanent or semi-permanent. Others—retaining rings in particular—may perform an entire fastening job themselves, and the connection may be either permanent or semi-permanent.

Then there are nails and pins. Most of them are not threaded, but they usually make semi-permanent joints; they can be removed without damaging the

product. Some nails, on the other hand, have helically threaded shanks that can make removal an extremely unrewarding task. And many a knuckle has been skinned in a vain effort to extract a retaining pin that was intended to stay put.

Obviously, fasteners are not readily categorized. But for the sake of convenience in this report, they will be divided into three broad groups—permanent, semi-permanent, and special. Insofar as possible, the discussion of each group will be confined to fastening operations on aluminum products.

Part 1 of this report includes a summary of a Modern Metals survey of fastening operations in typical product manufacturing plants (see page 28), followed by a brief history of the fastener industry and a discussion of alloys for aluminum fasteners.

Next month, Part 2 will deal with permanent fasteners—specifically, riveting and stitching. In subsequent months, Part 3 will discuss the use of threaded (semi-permanent) fasteners in aluminum products; and Part 4 will consider special fasteners—some of the more common ones, since these products are too numerous to list, much less describe.

Comparison of Joining Methods:

Cost, Equipment, Speed, Properties, Versatility

Before summarizing the results of Modern Metals' fastener survey, it might be instructive to briefly compare various joining methods with respect to cost, equipment needed, production rates, mechanical properties, and versatility. Generalities are dangerous in an area so studded with imponderables, but such a comparison may at least chart the relative advantages and limitations of joining processes such as riveting, metal

stitching, use of threaded fasteners, adhesive bonding, and spot welding.

As far as costs are concerned, riveting boasts low fastener and labor costs, and low to moderate equipment costs. Power costs are also on the low side. Much the same can be said of metal stitching. The cost of wire (or staples) will be lower than that of rivets, but the equipment may be a bit more expensive.

Threaded fasteners can be fairly cheap

to quite costly, depending upon size, class of threads, finish, and other variables. Direct labor cost is likely to run high because of the painstaking task of assembling bolts, nuts, washers, etc. (Sheet metal screws, on the other hand, may be power driven at pretty high rates of speed by unskilled personnel.) Equipment costs range from nil to moderate, depending on the need for operations such as reaming, tapping, etc.

Adhesive bonding can be an expensive operation. The adhesives that are best for metal-to-metal bonding often command a high price. Labor costs may range from low to very high, depending upon the adhesive used and the degree of perfection required. Cost of equipment may range from nil to high, depending upon whether or not special furnaces and autoclaves are needed. Great strides are being made in adhesive formulation, however, and the cost of this promising process seems certain to decline.

Spot welding involves no fastener cost, of course, and direct labor cost can be on the low side. Equipment, on the other hand, can be expensive, and special cleaning equipment may be necessary. Power cost is high compared with that of the other processes described. Spot welding is innately a high production process, however, so the overall cost per joint can be on the low side if the process is specified properly.

Necessary Equipment

As far as equipment is concerned, riveting can be done with a few simple hand tools. But most riveting operations employ machines that can range in complexity from single-spindle jobs to high speed units fitted with multiple heads and indexing fixtures. Auxiliary equipment may include punch presses or power drills.

Metal stitching is inherently a machine process, and the equipment may range from relatively simple to elaborate, depending upon the requirements of the job, size of part to be joined, etc. Equipment needed for threaded fasteners is simple and inexpensive. Pneumatic power tools are often used to boost production rates.

As mentioned earlier, adhesive bonding may require very little in the way of equipment, unless large curing ovens and autoclaves are needed. Spot welding machines, of course, may involve a sizable capital investment, and cleaning equipment may be a must.

Speed of Production

Production speed is subject to many variables, but metal stitching is probably the champ. Stitching is said to be twice as fast as spot welding and up to ten times as fast as riveting. Stitching also avoids preliminary operations such as punching or drilling of holes, cleaning, etc.

High production rates are also achieved with multiple-spindle machine riveting, especially when using bifurcated rivets which punch their own holes. Machine cycles of over 230 rpm may be achieved, and rivets are fed automatically.

Some threaded fasteners may also be fed automatically, but this can become complicated. As mentioned earlier, some types of screws may be power driven at fairly high rates, but the use of threaded fasteners is usually a slow process.

Adhesive bonding, too, is relatively slow — although methods of speeding it up are being developed. Spot welding, on the other hand, is a very high speed operation — especially when multiple head machines are integrated into a highly automated production line.

Mechanical Properties

As far as strength of joint is concerned, the bolted assembly is probably tops. Rivets, when properly driven, exhibit high shear strength. However, small rivets of the tubular and bifurcated type are not recommended for assemblies that must take high tensile or fatigue loads.

Stitching can produce a fairly strong joint in sheet metal work — especially when the stitches are placed in a diagonal pattern, and when a flat stitch is used. An adhesive bonded joint generally has excellent shear strength and fatigue resistance because stress loads are distributed over the entire joined area. Peel strength, however, is low.

Spot welding produces a joint with high strength in tension and compression. Shear strength, however, is usually lower than threaded fasteners and rivets.

Multi-Purpose Joining

Each of these processes has its own area of versatility. A rivet, for example, can also serve as an electrical contact, or a pivot shaft, or a spacer, or a stop. It can join dissimilar metals or non-metals to metals.

Stitching, too, is a good way to quickly join, say, rubber or felt or plastic to metal. Threaded fasteners permit the product to be taken apart for repair or maintenance. Like rivets, they may serve as shafts, electrical contacts or stops.

Adhesive bonding produces a "clean" joint (no visible fasteners) that is watertight and airtight. It is also ideal for producing sandwich panels. The spot welded joint is also inconspicuous compared with rivets and threaded fasteners.

Obviously, these observations are intended not as a guide to selection of a joining process, but as a general comparison of competitive methods.

MM Fastener Survey Reveals ...

Most Popular Fastener Materials Commonly Used Fasteners Fastening Problems Other Facts on Fastener Users

SPOTTED in the midst of Pittsburgh's steel producing facilities is a roofing and siding manufacturer who last year used 4 million mechanical fasteners while making products which consumed 2 million pounds of aluminum.

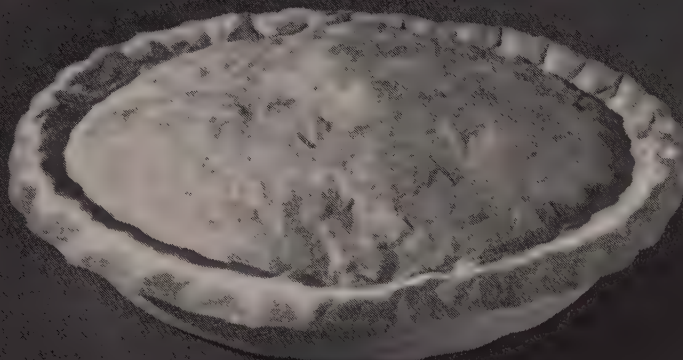
In culling facts from 230 replies to a Modern Metals survey on mechanical

fastening of aluminum, we found that this firm, Elwin G. Smith & Co., Inc., emerged as a "typical" aluminum fabricator.

In producing its roofing and siding products, the company fastens aluminum to aluminum and to stainless steel and wood. It uses rivets, screws, bolts, self-tapping and drive screws, blind

rivets, and a special clip of the firm's own design and manufacture. These fasteners are made of aluminum, stainless and plated steel.

While company business was only "fair" when the questionnaire was answered (late in 1960), the firm said it expects to increase production and business volume in 1961, with alumi-

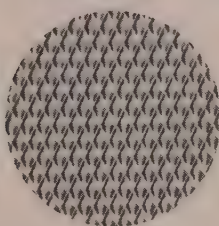


PLAIN...



OR PATTERNED

If you made aluminum crust for apple pie which would be best to use?



PLAIN OR PATTERNED? To help you decide, send for free sample kit of Fairmont embossed pattern sheets now putting new sales appeal into everything from awnings to truck bodies. Fairmont offers truly wide range of alloys, tempers, gauges, finishes. Write Dept. 20-A, Fairmont Aluminum Company, Fairmont, West Virginia.

THE RIGHT ANSWER TO ALUMINUM BUYING PROBLEMS depends upon right materials utilization.

For instance—many an item slated for plain sheet (because this *seems* to be most economical) can really be fabricated on a more practical level with one of Fairmont's embossed patterns. A lighter gauge embossed material provides dimensional stability, increases yield on a cost-per-pound basis, improves product eye-appeal.

MORAL: before final buying decisions are made, consult with a Fairmont field engineer. His mature and varied experience among aluminum fabricators makes him a whiz at application ideas that help you buy profitably. And he's backed by the aluminum source, according to a recent survey, that rates first for fulfilling promises and commitments.

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**TABLE 1: Materials
Fastened to Aluminum**

MATERIAL	USERS
Aluminum	210
Steel	84
Stainless Steel	69
Wood	56
Plastic	42
Copper	9
Brass	6
Other	26

NO. OF MATERIALS FASTENED TO ALUMINUM	CO.'S FASTENING ONE OR MORE MATERIALS TO ALUMINUM
1	84 (37.5%*)
2	64 (28.5%)
3	47 (21%)
4	18 (8%)
5	5 (2%)
6	4 (1+%)
7	1 (—1%)
8	1 (—1%)

*Percentage indicates what portion of respondents to this question the figure at left represents. Answers to this question: 224.

num consumption jumping 25%, to 2½ million pounds. Its use of fasteners will grow accordingly.

One survey question asked for the fabricator's "worst problem in mechanical fastening aluminum." In reply, the company's chief engineer reported that "Architects and building owners are often guilty of specifying the wrong type of fastener and fastener material for a job."

To solve this problem, he urged "more advertising and customer contact by fastener manufacturers and ourselves." He feels a continuous educational process is needed so that persons responsible for selecting fasteners will have solid knowledge on which to base final decisions.

Other "typical" aluminum fabricators were found in various parts of the country. Example: In San Diego, Calif., a window and door manufacturer consumed 1.5 million pounds of aluminum last year and used 2000 pounds of fasteners. A company official said business was "good," and anticipated an increase in 1961, with aluminum usage being upped 33% to 2 million pounds.

This firm fastens aluminum (sheet, extrusions, tube) to itself and to stainless steel, using aluminum, stainless, plated steel and plastic rivets, screws, bolts and self-tapping screws.

The firm reported trouble in coordinating fastening accessories. "Alcoa's screws and rivets have a 78° beveled

head. But the only counter-sinks available are shaped at 82°, our respondent pointed out. "This example indicates that better cooperation is needed between fastener manufacturers and tool manufacturers."

From the South

From Florida came a reply from a manufacturer of missile components and ground support equipment. This fabricator uses aluminum sheet, plate, extrusions, tube, and castings in conjunction with steel, stainless and plastics. Fasteners used include rivets, screws, bolts, self-tapping and drive screws, blind rivets and special fasteners made of aluminum, stainless, plated steel and plastic.

Good business prospects were forecast by the firm, which used about 1.2 million pounds of aluminum in 1960. (The company did not divulge amount of fasteners used.)

Most troublesome problem of this fabricator is galvanic action, especially when metal to metal contacts are subjected to occasional high temperature use. The senior metallurgical engineer recommended development of a fastener coating which could prevent galvanic action and still withstand the rigors of high-temp operation.

Moving up the center of the country we found a Detroit manufacturer of prime windows, storm sash and doors, jalousies and mobile home doors. This outfit reported "good" business; expects its aluminum requirements to jump from 12 million pounds in '60 to 16 million in '61.

Last year, the firm used 30,000 pounds of rivets, screws and self-tapping screws made of aluminum, stainless, plated steel and plastic to join aluminum sheet and extrusions to each other and to steel, plastics and wood. This company reported that new products in 1961 will require the use of more fasteners; and that it has "no big fastening problem."

230 Replies Reveal . . .

These are fastening facts of specific aluminum fabricators located around the United States. Now let's look at the overall picture as revealed by the 230 replies to Modern Metals' 13 point questionnaire.

First, we asked firms to list the products manufactured. Of the 224 who answered this question, 124 (55%) make building products. Other firms fell into the following categories: Industrial and institutional equipment, 27 firms (12%); electrical and electronic, 24 (10%); consumer durables, 15 (7%); transportation, 9 (4%); signs and displays, 5 (2%); miscellaneous, 20 (9%).

Statistics on the amount of mechan-

ical fasteners used were reported by 158 respondents. Answers were given either in number or pounds of fasteners, with 47 firms reporting use of a total of 106, 610,000 fasteners, while 101 firms consumed 524,540 pounds of joining devices.

In addition to determining how many fasteners were used in 1960, we asked if fastener use would increase or decrease this year. Of the 190 firms that answered this query, 173 said that usage will rise, while 17 expect it to drop.

Most of those looking for fastener use to increase based this prediction on an optimistic look at 1961. They see sales and production increasing, resulting in more fasteners being used. But 31 companies were more specific. They will use more fasteners next year because they are adding new products.

An additional eight firms will use more fasteners when fabricating aluminum in 1961 because, as they put it, "Aluminum, more and more, is replacing other materials in our products."

Less fasteners will be used by 17 companies this year who are replacing mechanical fastening with other methods. The foremost replacement for mechanical fasteners is spot welding, with adhesive bonding second.

Aluminum consumption figures were reported by 185 respondents. They consumed a total of 241,229,300 pounds of aluminum in 1960; say they will increase this 26% to 304,261,933 pounds in 1961.

(Continued on page 32)

**TABLE 2:
Aluminum Forms Used**

FORMS OF ALUMINUM USED	USERS
Sheet	177
Extrusions	176
Tube	105
Die Castings	64
Other Castings	55
Plate	50
Other Forms	11

FORMS OF ALUMINUM USED	CO.'S USING ONE OR MORE FORMS OF ALUMINUM
1	58 (26%*)
2	45 (20%)
3	44 (19%)
4	45 (20%)
5	22 (10%)
6	11 (4%)
7 or more	3 (—1%)

*Percentage indicates what portion of respondents to this question the figure at left represents. Answers to this question: 223.

something new in aluminum
for the building industry

If you manufacture building components—curtain walls, sun shades, windows, sliding doors, structural parts, or other architectural products—Harvey Aluminum can bring you up to date on the newest advances in aluminum.

As a major supplier to the building industry: **1.** We produce any size primary mill products, from the smallest glazing part to the largest structural application. **2.** We

specialize in custom-designed components, yet we deliver standard shapes for any architectural application. **3.** We assist architects and engineers in creating custom designs and basic structures of aluminum, for original building concepts. **4.** Your aluminum building sections are processed with the same production and quality control procedures we use for critical missile,

aircraft and electronic components. **5.** And, as an integrated producer of primary aluminum, we offer sound technical assistance on any building problem. Call

the nearest Harvey Aluminum office. Find out what's new in aluminum. Find out how you get all the extras in aluminum from Harvey Aluminum.



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Aluminum

A major independent producer of quality aluminum in all alloys and sizes: Pig, ingot, billet, rod and bar, pipe, tube, hollow sections, press forgings, forging stock, hand forgings, impact extrusions, electrical bus bar, structurals, special shapes, light and heavy press extrusions, screw machine and other aluminum products. Similar products in titanium, zirconium, and steel.

HARVEY ALUMINUM SALES, INC.
Torrance, California

Answers to other questions revealed what materials aluminum is fastened to (see Table 1); what forms of aluminum are used in product manufacture (see Table 2); what type of standard and special fasteners are used (see Table 3); and what fasteners are made of (see Table 4).

Perhaps the most important questions on the survey are those which asked for a description of the worst problems encountered in mechanical fastening aluminum, and what the possible solutions might be.

Problems noted by the 59 firms answering this question include: Fastener breakage and thread stripping (by 25 firms); slowness of fastening (by 11 firms); difficulties in anodizing (5); high cost of fastening (5); difficulty in buying fasteners and lack of technical information (5); concealing fasteners (4); and corrosion of fasteners (4).

As expected, problems were more abundant than solutions. Most manufacturers who griped about fasteners which crack, or have heads that snap off, or threads that strip, claimed that fasteners made of stronger alloys would solve the problem. This would seem to place the blame on fastener manufacturers.

However, one fabricator who complained of soft rivets admitted that "maybe what is needed is more careful selection (of rivets) on our part."

This is more realistic. Selecting fas-

teners for a particular product is just as vital as choosing other materials. But many fabricators purchase fasteners which ultimately fail because they were given a task for which they weren't designed.

So the solution may not be as hopeless as it sounds. It does not have to entail long arduous hours of new alloy development and fastener redesign by manufacturers.

Solution may mean, in many instances, only a more thoughtful approach to fastener selection by fabricators. Manufacturers will help. Also, tips on rivet selection are given in the next segment of this series, and recommendations for choosing standard and special fasteners will be covered in subsequent installments.

Other factors could account for fastener failure. Even if the correct fastener is used, it will break if it is not applied properly, or if the product itself is designed poorly.

No suggestions were made on how to speed up mechanical fastening in production lines. Instead, respondents proposed alternatives such as welding, adhesive bonding, designing self-jigging interlocking products, etc.

Costs Perplex Fabricators

Manufacturers complaining of high costs also had few ideas on how to alleviate their plight. Those encountering difficulty in anodizing fastened products found themselves in the same fix. (This series of reports will also try to help out in these areas.)

Two problems popped up that can be solved only by fastener manufacturers and distributors: Lack of stock in certain areas; lack of technical literature on "fastenecring."

Marton Architectural Fabrication of San Francisco, claimed that fastener supplies in that area are limited. The Orlando Boat Co. in Orlando, Fla., reported a lack of special fasteners. An architectural fabricator in Illinois complained of difficulty in "getting information and fasteners for small usage in special problems."

Vulcan Rail and Construction Co. of Bellwood, W. Va., hasn't been able to obtain sufficient "information on the use of rivets in fastening materials ranging in thickness from 1/2 to 1 1/2 inches."

Atlas Metal Industries of Hialeah, Fla., has trouble "locating the special fasteners so often illustrated in the design handbooks." And it proposed a solution—a master catalog or file which tells where special fasteners can be obtained and which also lists dimensions, cost factors, etc.

Concealing fasteners may be a problem, but the only plausible solution is to redesign the product so that joining devices are hidden.

TABLE 4:
Fastener Materials

MATERIAL	USERS
Aluminum	189
Plated Steel	137
Stainless Steel	121
Copper, Brass	19
Plastic	18
Bare Steel	16
Other	5

NO. OF MATERIALS USED IN FASTENERS	CO.'S USING FASTENERS MADE OF ONE OR MORE MATERIALS
1	54 (24%*)
2	76 (34%)
3	75 (34%)
4	14 (6%)
5	1 (—1%)
6	2 (—1%)

*Percentage indicates what portion of respondents to this question figure at left represents. Answers to this question: 222.

Those firms who experienced corrosion with fasteners say that aluminum is the answer, providing fasteners can be found which can meet other product specifications, such as strength.

Many firms said they either had no difficulties or that they were minor. One California manufacturer of metal buildings, screens and storm doors said this of mechanical fastening: "Compared with other methods, we encounter no problems at all."

In an effort to determine a pattern of fastener usage within a specific industry group, we lumped together all questionnaire replies from manufacturers of aluminum windows and doors. There were 43 of these, representing 19% of total replies.

Figures on aluminum usage were reported by 34 of the window-door plants. Altogether they used 100,865,000 pounds of aluminum in 1960; expect to use 132,835,333 pounds in '61—a 32% increase.

We were not surprised to find that extrusions are the form of aluminum most commonly used by window and door plants (39 of the 43 plants reporting). Sheet ran a close second (36 plants), followed by die castings (15 plants) and tube (14 plants).

Answers to the question on types of fasteners used revealed a stand-off between screws (reported by 39 window and door plants), self-tapping screws (by 38 plants), and rivets (by 33 plants). Other fasteners used include blind rivets (by 21 plants), bolts (by 16), drive screws (by 12), and special

TABLE 3:
Fastener Forms Used

FASTENER	USERS
Screws	176
Rivets	171
Self Tapping Screws	152
Bolts	122
Blind Rivets	85
Special Fasteners	71
Drive Screws	57

(59 companies use one type of special fastener; 12 use more than one)

TYPES OF FASTENERS USED	CO.'S USING ONE OR MORE FASTENER TYPES
1	30 (13.5%*)
2	28 (12%)
3	52 (23%)
4	34 (15%)
5	33 (15%)
6	26 (11.5%)
7	18 (8%)
8	2 (1%)

*Percentage indicates what portion of respondents to this question figure at left represents. Answers to this question: 223.

CRITICAL ALUMINUM BRAZING PROBLEM SOLVED BY *Sunbeam* INFRARED FURNACE



Sunbeam Corporation cuts production costs 3 ways!

THE PROBLEM: When Sunbeam Corporation decided to braze elements to the bottoms of frypans, many problems had to be considered. With existing brazing methods, two primary factors would keep furnace operating costs high—idling time...and costly replacement of alloy conveyor belts due to molten flux attack.

THE SOLUTION: For an answer to these problems, Sunbeam Corporation called on Sunbeam Equipment Corporation. Working with Sunbeam Corporation, Sunbeam Equipment engineers came up with a simple but effective solution. Using quartz infra-red lamps in a water cooled tunnel, they designed a new compact, conveyORIZED furnace with extremely quick heat-up characteristics.

3 WAY SAVINGS

The new furnace can be easily turned off between production runs. The conveyor belt has been in operation for over two years. Belt construction and low cost permits economical extension of the loading and unloading tables. With water cooled furnace roof and walls*, the gold plated reflectors assure longer life.

WHAT'S YOUR PROBLEM

The brazing problem at Sunbeam Corporation is just one of the thousands of heat treating problems that Sunbeam Equipment engineers have successfully solved. Our 65 years of experience and superior plant facilities are at your disposal. **Sunbeam Equipment Corporation**, 196 Mercer Street, Meadville, Pennsylvania.

*Water cooled reflector design patented



Close up view of quartz elements and gold plated reflectors that heat work as it passes through furnace. Elements provide heat-up and reflectors are easily maintained.

INDUSTRIAL



FURNACES

fasteners (by 10 plants).

An attempt to correlate fastener usage with aluminum consumption in window and door plants proved unsuccessful—principally because some plants reported in terms of pounds of fasteners, while others reported numbers of fasteners.

However, it may be of interest to

note that 13 manufacturers of aluminum windows and doors used a grand total of 41,570,000 fasteners of all types in 1960. When you consider that the entire industry consists of over 500 firms, it's obvious that the aluminum window and door business offers a substantial market for fastener manufacturers—particularly those who supply

screws, self-tapping screws and rivets.

A final point of interest is that only three of the 43 window and door plants reported a fastening problem. Two complained of threads stripping; the other griped about the high cost of fasteners. Also, 35 of these firms expect to use more fasteners in 1961; only three say they will use fewer fasteners.

History; Alloy Selection and Treatment

The Story of Aluminum Fasteners;

How Fastener Manufacturers Select and Treat Alloys

by Richard Ladner, Manager, Fastener Sales; Arthur Hartwell, Supt.
Lancaster Plant, Aluminum Co. of America

PRODUCTION of aluminum fasteners dates back to the infancy of the aluminum industry itself. As early as 1895, Metcalf and Ferguson Co. made aluminum wire, rod and rivets for the Pittsburgh Reduction Co.

In 1900, Pittsburgh Reduction began producing its own rivets, and by 1906, the year before the company became Aluminum Co. of America, the rivet department consisted of two employees operating four machines. Growing demand, primarily for cooking utensils, kept rivet production on the upswing. Average monthly output jumped from 4647 pounds in 1911 to 23,450 pounds by 1920.

Three years later the rivet department was transferred to the Edgewater, N.J., plant of United States Aluminum Co., a subsidiary of Alcoa. The Aluminum Screw Machine Products Co., with Alcoa the major stockholder, had been organized at Edgewater in '22, originally to produce items machined from aluminum rod. It also made aluminum fasteners.

The principal rod stock for ASMPC was Duralumin, developed in Europe as alloy 17S, and now designated alloy 2017. Duralumin and alloys developed

later by Alcoa were suitable for making fasteners because their strength could be improved by heat treating. Except in special cases, those early heat-treatable alloys are still the basic stock for aluminum fasteners.

Alloy 2024 was developed by Alcoa during World War II but was not used for fasteners until later years. Alloys 6061 and 6053 were developed in the middle twenties. Alloy 5056, a non-heat treatable composition used primarily for special rivets and other fasteners, was developed in the middle thirties.

Two More Alloys Developed

During World War II, Alcoa developed heat treatable alloys 7277 and 7075 for defense applications. Both are still used for fasteners, though use of 7075-T6 is limited because bolts made of 2024-T4 can absorb more unintentional bending or shock loads. Alloy 1100, used in some rivets and washers, is commercially pure aluminum.

Continuing its work in screw machine and cold headed products, the ASMPC periodically bought more equipment to meet growing demand. As the business grew, the company began stocking standard items. By 1930, some 43%

of sales consisted of orders for standard machine screws, wood screws, nuts, bolts, etc.

In 1931 Alcoa acquired practically all remaining stock of ASMPC, which was absorbed the following year into the operations of United States Aluminum Co. Fastener production remained a separate operation at Edgewater—the only one of its kind.

Then came World War II. The impact of defense requirements is explained by this notation in company records: "The demand for rivets needed for the aircraft program during the war was astronomical . . ."

Additional rivet headers were installed at Alcoa's Massena, N.Y., works, where wire and rod were produced. In 1940, more headers were installed at the Vernon, Calif. works, and Alcoa shipped 1,573,000 pounds of rivets from its three locations. By 1942 Alcoa's rivet capacity had reached 7 million pounds annually.

But this was not enough. Early in '42 the War Production Board asked Alcoa to find more rivet capacity to meet anticipated requirements of the aircraft program. After WPB's request, new manufacturers of aluminum rivets came

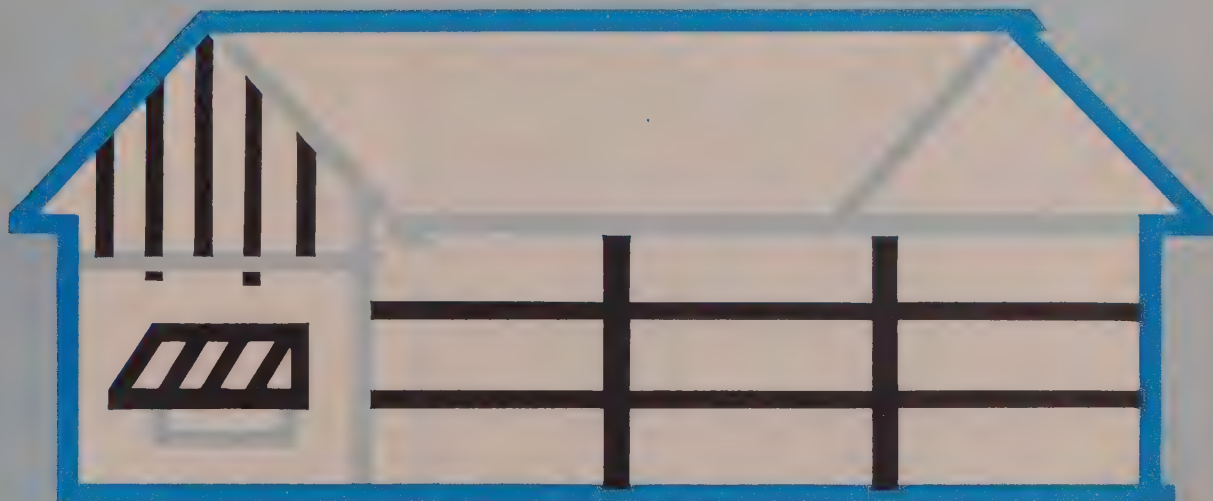
Recommended Thermal Treatments for Aluminum Fasteners

Alloy	Temper Desired	Solution Heat Treatment	Precipitation Heat Treatment	
		metal temperature	metal temperature	approx. time of heating
2017	-T4	940°F.		
2024	-T4	920°F.		
2117	-T4	940°F.		
6053	-T6	970°F.		
6061	-T6	970°F.	350°F.	6-8 hrs.
6061	-T6	970°F.	*320°F.	16-20 hrs.
		970°F.	*350°F.	6-10 hrs.

*Optional

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DESOTO CHEMICAL COATINGS, INC.

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into being, thus laying the groundwork for a broader aluminum fastener industry. Following the war many fastener manufacturers continued to make aluminum rivets, screws, bolts, nuts, washers and nails.

Alcoa's pre-war developments at Edgewater helped establish the industry. Most important basic development was the refinement of the cold heading method. The fastener department found barrel burnishing to be an economical way to finish fasteners. It also accomplished economical production of chamfered shank rivets, perfected close dimensional control of rivets for aircraft, and produced some less common

items such as wing nuts and tubular rivets.

As the aluminum fastener industry matured and progressed, the Edgewater department was superseded by a new fastener plant. In 1954 the last of the equipment from the old fastener and screw machine department was transferred to join newer pieces of machinery at Alcoa's modern Lancaster, Pa., works—the largest single shop in the world devoted exclusively to the production of aluminum fasteners.

Proof that aluminum is widely accepted as a material for fasteners is evidenced by the 5 billion aluminum fasteners used annually—everything from

standard nails, screws, rivets, bolts and nuts to a wide variety of special and proprietary fasteners.

The properties of aluminum make it especially desirable for making fasteners. Its light weight, good appearance, corrosion resistance, strength-to-weight ratio, and low cost by volume have prompted its increased use in the transportation, building, consumer durable goods, and other industries that are among the largest users of aluminum fasteners.

Tests have demonstrated that high strength aluminum fasteners have a shear strength equal to that of mild steel. But the most vital subject in any consideration of aluminum fasteners is heat treatment, which improves the strength and corrosion resistance of aluminum.

Unless heat treatment is complete, however, lack of these advantages may cause problems in performance. Such problems may arise when a manufacturer decides to economize by choosing an alloy unsuited to the requirements of an application.

To Select, To Treat

Here are some general instructions for the selection and heat treatment of aluminum alloys for standard fasteners (technical experts should be consulted for more detailed information):

Alloy 2024-T4 is the preferred stock for bolts, cap screws, and machine, wood and sheet metal screws. Alclad 2024-T4 is preferred for washers. The primary alloy for aluminum nails is 6061-1913.

Hexagon bolt nuts 5/16-inch and larger are produced from alloy 6061-T6. All other nuts are made from alloy 2024-T4. Many aluminum alloys are used to make rivets, the common ones being 1100-F, 2117-T4, 2017-T4, 2024-T4, 6053-T61, and 6061-T6.

For general fastener work, alloy 2024-T4 has high strength and good corrosion resistance. Alloy 6061-T6 has good strength and should be employed where severe corrosion is to be encountered. While alloy 7075-T6 is slightly stronger than 2024-T4, the latter is more suitable for fasteners because it is less likely to rupture during assembly.

All fasteners (except nails) that are produced by the upset method—cold forming the head by pushing wire into a die—are heat treated after fabrication. Standard methods for heat treating aluminum alloys are detailed in the accompanying table.

Nails are generally produced from heat treated, aged, and cold worked wire (6061-1913) or from highly cold worked wire (5056-H19). Heat treated stock is also used in making fasteners, such as nuts, which must be machined from bar stock.

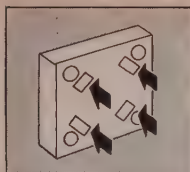
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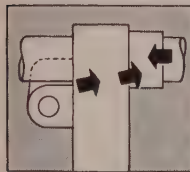
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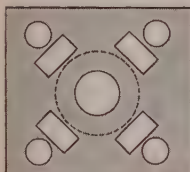
Write for
Complete
Details



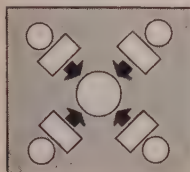
1. Each corner link is a strong, self-contained support for both plate and die.



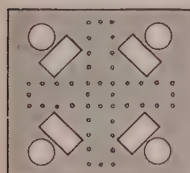
2. Short and direct transfer of loads on each corner minimizes bending stresses on the moving die platen and back plate.



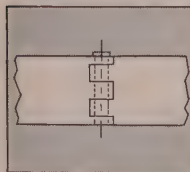
3. Reduces the area of unsupported moving die plate. Helps eliminate flashing and potential cracking of dies.



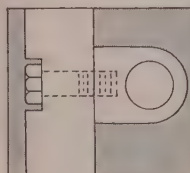
4. Prevents weaving of the link center axis (crosshead) and consequent unequal loading.



5. Permits a large area of both horizontal and vertical bumper pin ejection pattern.



6. Corner positioning of each link assembly results in equal and straight line loading of all pins and bearings in the link pivots.



7. Toggle anchors are bolted to the back and traveling platens. They are not subject to weld breaks or breakage as part of a casting.

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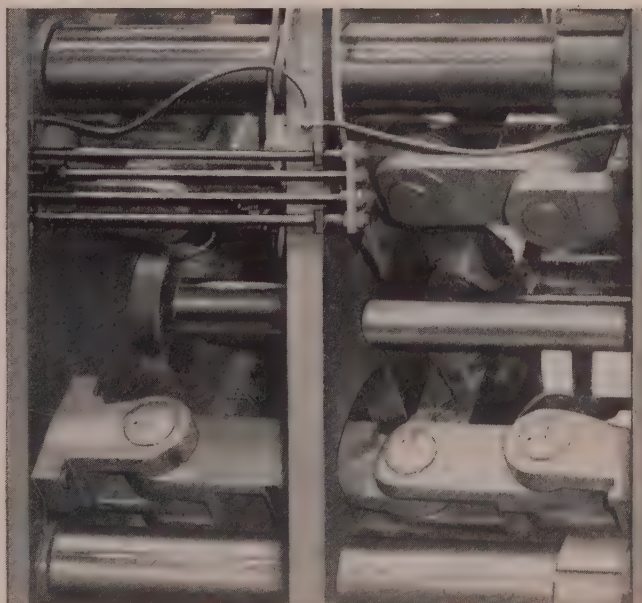
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Switch To TIG Welding Ends Repair Headache For Office Furniture Firm

CASUAL, carefree living has exerted a strong influence on the metal furniture market. Manufacturers of office, dinette, and outdoor metal furniture see excellent prospects for long term growth. The market is nearly doubling every ten years, and should reach \$1.2 billion by 1970.

In office furniture, largest segment of the industry, metal now accounts for 81% of sales. Styling plays an important part, even influencing purchasers to replace furniture which is serviceable.

One of the first manufacturers of aluminum office chairs was General Fireproofing Co. Oxy-acetylene welding and flux-coated aluminum rod were used to fabricate chairs at the company's plant at Youngstown, Ohio. Production problems were experienced with oxy-acetylene welding, but little could be

done until a better process was found.

One of the problems was weld porosity, resulting from moisture absorption and instability of the welding flux. Because the flux coating obscured pinholes in the weld, these could not be detected until the chairs were sent through the anodizing tank—one of the last stations in the production line. Repairs sometimes consumed as much as 60 man hours in a two-shift interval.

What's more, the flux contaminated acid and water wash tanks, as well as anodizing tanks. Weld craters in welded joints appeared darker than the surrounding areas when anodized, requiring heavier and darker touch-up in color anodizing.

With complete conversion of the assembly line to the Heliarc welding process of Linde Co., General Fireproofing

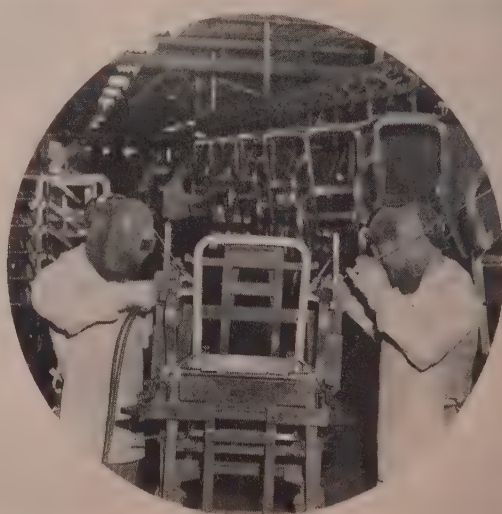
eliminated all problems due to welding flux. Argon shielding of welds in this process eliminates the need for flux. Uncoated 5356 aluminum alloy rod is now used where filler metal is required. Tungsten-arc fusion (TIG) welding of chair leg seams and bottom leg blocks eliminates filler rod completely. And from the user's standpoint, corrosion of chairs due to flux inclusion in close-fitting parts has been eliminated.

TIG welding also improved weld bead and penetration, and reduced distortion due to warpage, thus permitting exact dimensioning of chairs and the production of entirely new designs, such as the functional "stacking chair."

In the overall production picture, General Fireproofing attributes 50% cost savings and greatly improved product appearance to TIG welding.



■ Corners of aluminum channel seat frame are welded in sub-assembly operation. Filler rod requires no flux due to shielding flow of argon.



■ In less than 50 seconds, two weldors tack weld back, seat, arms and front legs of this aluminum office chair, at General Fireproofing.

8 NEW VOSS LEVELERS AT U. S. STEEL!



VOSS VERSATILITY DEMONSTRATED IN LEVELER APPLICATIONS AT U. S. STEEL

The United States Steel Corporation has been using Voss Levelers for many years. During the past 2 years, U. S. Steel has again shown its confidence in Voss by ordering *eight new levelers* for installation in various plants. The applications are varied, ranging from galvanized and cold-rolled to plate and high-yield missile stock. Exclusive patented Voss principles enable *all* users to get better than stretcher-level flatness under most conditions, and at high production speeds . . . results unobtainable with any other leveler.

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HERE'S THE RUN-DOWN:

INSTALLED:

GARY SHEET AND TIN MILL

Application: Tin Plate Installed: 1958

IRVIN WORKS

Application: Cold-rolled Shear Line Installed: 1959

Application: High-Speed Galvanizing Line Installed: 1960

VANDERGRIFT WORKS

Application: High-yield Missile & Stainless Steels

Min: .062 Max: .1875 Installed: 1960

ON ORDER:

GARY SHEET AND TIN MILL

Application: Hot and Cold-rolled Steel Plate

Min: .062 Max: .250, 75" width Installation: Late 1960

IRVIN WORKS

Application: Cold-rolled Shear Line Installation: Late 1960

COLUMBIA-GENEVA DIVISION

Application: Cold-rolled Shear Line Installation: Early 1961

Application: High-Speed Galvanizing Line Installation: 1961

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PRODUCT BY



PROCESSING BY ***NSE***

PRE-PAINT PROTECTION BY



ALODINE*



A typical Alcoa Alumalure building siding installation is shown in the clean, functional lines of the Robinson Building, Elyria, Ohio.

How Amchem Pre-Paint Treatment, NSE Processing Help Put the "Lure" in Alcoa Alumalure!**

Alcoa Alumalure baked enamel finish on industrial roofing and siding sheet has made a startling impact in building circles. A low cost, decorative, maintenance-free exterior wall surface, available in 11 colors, it is widely used for new buildings as well as remodeling older structures.

Key to Alumalure success—strong, light aluminum and design innovations by Alcoa . . . precision finishing by NSE Signs & Stampings . . . unmatched protection and paint adhesion by Amchem Alodine chemicals.

With color matching standards a prime-requisite, assurance of paint adhesion on Alumalure sheets is a vital necessity to protect customers who buy the product, months later reorder and expect exact color match. Results to date on millions of square feet of Alumalure processed—no paint failure or rejects involving chemical treatment by Alodine!

Rigid quality control has resulted in a fine production record for Alumalure at NSE's Birmingham plant.

Full time NSE and Alcoa inspectors watchdog every foot of sheet throughout the production cycle. For chemical pre-treatment Alcoa specifies high standards of Government Specification MIL-C-5541. NSE selected and uses Alodine for "the best metal preparation treatment you can find." NSE management states emphatically, "There's no question about what Alodine has done for the preparation of aluminum for painting. We don't have paint failures. We don't have customer rejects."

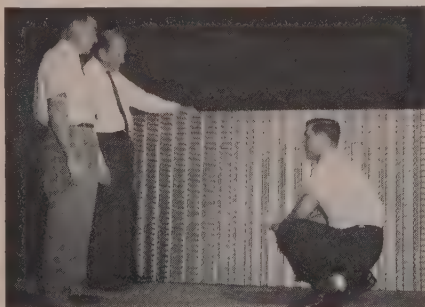
An "extra" plus from Alodine—Alcoa finds additional customer appeal in the gold coat Alodine creates on Alumalure backing which provides a pleasing antique decorative finish for building interiors.

If you want—corrosion resistance, lasting paint adhesion, rejects slashed to the vanishing point and sales ammunition that helps sell products—investigate Alodine, the industry's first and today's standard conversion coating chemical for aluminum!

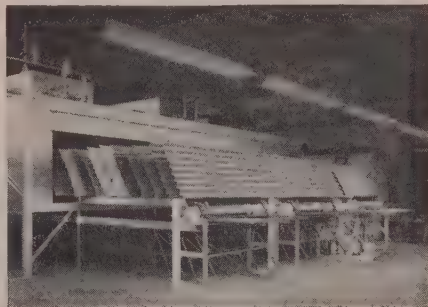
* Amchem's trademark for its conversion chemical coating for aluminum.
** Trademark of Aluminum Company of America.



After treatment with Alodine, a ribbed siding sheet is painted employing Ransburg electrostatic paint equipment. NSE can run two sheets in tandem, accomplishing 60-lineal feet per minute painting.



NSE Executive Vice-President John Montgomery (left), Plant Manager R. Cater Lee, and Alcoa (quality standards) specialist J. Shea (right), inspect "3D" Alumalure sheet.



The massive equipment shown here is an ultra-modern, newly installed Lantzy oven for handling Alumalure sheets.



ALODINE

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Write for free bulletin 1424C, outlining the uses and many different types of Alodine available for aluminum fabricators and processors.

Refractory Mold Coating Aids Casting of Aluminum Gear Housings for Automatic Washers

THE WAY the Maytag Co. sees it, any effort to produce a better automatic washing machine should include the goal of eliminating the need for service. Extensive engineering research is carried on continuously to achieve this, and the activity has many avenues of investigation.

An example of the extent to which Maytag carries its engineering research was connected with the production of cast aluminum gear housings and covers used on the washers. The housings are designed for the life of the machine, with no need for further lubrication.

Design of the gear housing and cover casting is such that it is difficult to produce a part free from shrinkage and surface defects. Through the use of a new type of refractory mold coating, improvements were noted over results achieved with the former mold material, minimizing these problems. The new coating is "dag" 193, a material which Maytag foundry experts decided has the required heat transfer and release properties.

Up to 2500 gear housings and an equal number of gear housing covers are produced in one 3-shift work day by 6 operators. Each housing weighs about 4 pounds; is $\frac{1}{4}$ - $\frac{3}{4}$ inch thick.

After experimentation, it was decided that non-heat treated hot work tool steel, S.A.E. H-13, was best for aluminum permanent molds. The analysis of the alloy used in making the permanent mold castings is continually checked and controlled by Maytag's own spectrographic laboratory.

Coating Stops Shrinkage

New coatings of "dag" 193, a product of Acheson Colloids Co., Port Huron, Mich., are applied to the molds during each shift. Use of this mold coating guards against shrinkage, especially where the casting shape varies from narrow to thick. The continuous film of insulating particles spreads uniformly over the entire mold surface, reaching critical areas to provide proper insulation for all parts of the casting. Operators may occasionally touch up areas which require more protection.

The mold coating dispersion, supplied in paste form, is mixed with water at a 1 to 3 ratio (actually governed by specific gravity) before application, in a 100-gallon tank. It is then applied with commercial spray equipment at line pressure.

The combination of H-13 steel, which

eliminates the cracking problem and "dag" 193 makes for sound, trouble-free parts, according to Maytag. The original H-13 steel mold is still on the line after four years of use.

Inspection procedures are rigid. Molds are held at a temperature of approximately 700°F., controlled with water and air. They are pre-heated before the "dag" 193 is applied. Periodically, sample castings are removed from the line and tested for pressure tightness. If leaks are found, corrective action is taken on the molds. If touch-up is needed it is done immediately.

After casting, all gates and risers of the gear housings are removed with a stationary circular saw to which parts are fed on a moving carriage. Gates and risers on the cover castings are broken off by the mold operator while the casting is still hot.

Before machining, all castings are 100% water-tested under pressure. All gear housings are once more tested for pressure tightness after machining.

The castings are then assembled, enclosing the gear train, a rubberized cork gasket between the housing and its cover, and the unit is filled with lubricant. If lifetime lubrication is to be maintained, pressure tightness is a vital requirement in keeping detergents and other materials out of the gear case.



■ Operator sprays 'dag' dispersion 193 on permanent mold used in manufacture of gear housings for Maytag automatic washers. Application of mold coating minimizes scrap, guards



against shrinkage and allows easy release of completed casting from mold, such as shown at right. Maytag casts approximately 2500 gear housings and covers daily.

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1960 Man of the Year: Siding Pioneer Jerry Kaufman

■ With ceiling-high inventory of Alside products as a back-drop, President Kaufman, flanked by James C. O'Hear, vice president, manufacturing (right) and Lawrence L. Cochran, plant manager, are caught spot-checking a package.

by H. K. Darby
Associate Editor

MORE THAN 340 million square feet of aluminum siding with a total retail value of over 400 million dollars was applied to new and old homes in the U. S. last year.

In producing this most modern of home sheathing products, the nation's 30 to 40 aluminum siding manufacturers chewed up some 170 million pounds of aluminum sheet, and consumed at least 700,000 gallons of enamels. They also used up incalculable quantities of aluminum cleaning and conversion coating compounds, and drummed up a brisk business for manufacturers of roll forming machines, roll coating lines, spray-painting apparatus and other types of finishing and fabricating equipment.

In less than five years, residential aluminum siding has risen from an obscure home improvement product to the top of the heap among markets for aluminum sheet. As recently as 1957 it consumed only 58 million pounds of aluminum, and was used almost exclusively as a remodeling product for older homes.

Today, aluminum siding with durable baked enamel finish is specified for many thousands of new homes. It is the subject of network TV commercials and 4-color ads in the big shelter magazines.

Industry analysts expect this one product to use at least 300 million pounds of aluminum sheet annually by

1965. It is aluminum's fastest growing major market—comparable, in many ways, to the aluminum window industry ten years ago. Many men have contributed to this growth, but the one who is generally considered the siding industry's prime mover is Jerome J. Kaufman, president and chairman of Alside, Inc., Akron, Ohio, the biggest producer of aluminum siding.

Since Kaufman's contributions to the growth of aluminum siding have benefited the aluminum industry as a whole, Modern Metals has selected him as Man of the Year for 1960 in the light metals industry.

This Is Fast Growth

Kaufman created Alside only 13 years ago. Last year, the company did \$23 million in net sales, had a capital valuation of \$17 million, boasted a production capacity of 400 million square feet of aluminum siding annually—more than the rest of the producers combined, Kaufman claims—and sold siding through its network of some 6000 dealers and distributors, who are supplied by 21 Alside warehouses.

Despite its already pre-eminent position in the industry, Alside is pushing a plant improvement program that will boost capacity 30%. The company went to public ownership in mid-1960, is now listed among the over-the-counter stocks.

But a new development typifies, perhaps more than any other single event,

Kaufman's dynamic drive. While conventional siding will be Alside's main product for many years to come, the firm is preparing to make and market a small, prefabricated single-family home of advanced design. Kaufman calls it a "compact" house, and claims that it will approach as closely as possible the "all-aluminum" goal of the primary producers.

The home's designer is architect Emil A. Tessin, director of Alside's product development. The M.I.T. trained architect also designed the firm's new office building and plant near Akron. Set well back from the state highway and highly suggestive of the futuristic buildings seen at the Brussels World Fair, Alside's new headquarters makes its own favorable contribution to the industry's image.

The 41,000-square-foot, two-story building (one of the first to use aluminum and glass curtain wall construction in the Akron area) houses an airy general office, a cafeteria, and an executive dining room on ground level. A suspended staircase leads to the executive level where a 45-yard vista stretches from the advertising manager's office to the gold anodized decorative grille which shields the entrance to Kaufman's office. Off this deeply carpeted corridor are executive offices that would compare favorably with the most plush offices anywhere.

But Kaufman's circular office is the real

Alside's president and chairman started the firm when aluminum home siding was still untried; nursed the company through its initial trials; now has even more impressive plans blueprinted for this bustling company.



■ Alside's office building is a big attraction on the State road outside Akron. Bow-tie-shaped building on pillars houses executive suite. Jerry Kaufman's circular office is shown at left. Ground will be broken on this 100-acre tract for entirely new plant, 300,000 square feet for Alside's prefab home manufacturing.

showcase. Forty feet or so in diameter, high-ceilinged and deeply carpeted, it is an ideal atmosphere in which to guide the corporate ship.

Kaufman's business career began when, upon graduation from the Erie (Pa.) Academy, he left home and supported himself as a salesman. He is still a salesman, though it can also be claimed that from the start he has been an earnest contributor of ideas to his own engineering people.

Kaufman can't remember when he hasn't had some idea for a new or improved product to mull over. Some of them died aborning; others were kept for thorough examination and final elimination. But many were ticketed for enthusiastic execution, as in the case of Akron Roofing & Siding Co., Kaufman's first business venture.

In 1938 Kaufman decided there was room in Akron for another roofing and siding contractor. First he went to work in the field to learn the ropes; then he organized his company. Arthur C. Mentall, Alside's executive vice president, recalled Kaufman's early days as an entrepreneur.

"We became acquainted the year he started the business, when I was handling FHA jobs for the J. M. & L. A. Osborn Co. in Cleveland," Mentall said. "Jerry couldn't have been more than 21, but he worked long hours on sales and became our biggest roofing and siding dealer within six months. He was also well thought of by the various lending agencies."

Next Move: Siding

Kaufman was drafted into the army in 1945. When he was mustered out in '46 he was 29 and restless. A successful contracting business had kept his small family comfortable while he was in uniform, but now he discovered that roofing and siding contracting no longer stimulated him. He had another idea.

While in the army, he'd noticed the excellent bond between paint and metal on transport planes, and visualized

painted aluminum as home siding — but colored white, yellow or gray, rather than olive drab. Result was that his return to civilian life was only a token return to the contracting business.

In the light of Kaufman's almost feverish evaluation of what to him was a brand new application of aluminum, it seems to have been pre-ordained that a Reynolds Metals Co. district salesman should set up his headquarters in the same building as Kaufman's contracting firm.

What Kaufman didn't know was that Reynolds had launched experimental production of aluminum siding in 1945, and then took the plunge into commercial production in the first postwar year. As early as 1945, Reynolds had produced 10-inch clapboard siding. William G. Reynolds, vice president of the firm, had conceived the application.

Well Promoted in '46

David Reynolds, executive vice president, recalled recently that "we had a bid ad program going in the Saturday Evening Post and the shelter magazines in 1946, and had put up aluminum clapboard-sided test houses on the campus at Purdue University and in Louisville."

At the height of Reynolds' \$1 million siding promotion, William E. Yates, now a Reynolds market manager on the West Coast, lost no time in bracing Kaufman for an order. Yates must have been surprised at the alacrity with which his neighbor ordered a carload of unpainted horizontal aluminum siding.

"That was the way we sold it—unpainted," David Reynolds said. "Our concept then was that it would be treated with some kind of a brushed-on primer and painted in the field. Sales got off to a flourishing start, but we were to learn how little we knew about merchandising this product. The pipeline finally became filled and things started to die on the vine."

Reynolds gives Kaufman full credit for spotting the trouble.

"Here we had national dealer distribution but Jerry was the one with the answer; he was having the devil's own time selling that carload of siding, but when I spoke to him on the phone, he said, 'The only way we're going to sell this is to paint it white and bake the coating on right in the plant.' He was 100% correct!"

Savings Were Pooled

Although there was some disagreement among the primary producers as to aluminum's worth as a siding material, Kaufman's enthusiasm matched Reynolds'. Without delay he started to organize a manufacturing company. To his own savings were added those of his brother, Manual, Arthur Mentall, and Louis L. Manes, an attorney and long-time friend who has served as Alside's general counsel since the company's inception. The new company started with \$100,000 which was quickly spent for a new plant and equipment.

Kaufman was rarely seen at the contracting office, but became well known to the staff at the Akron Public Library where he absorbed as much information as he could about aluminum, its production and fabrication. He noted carefully the suggestions of Alcoa and Reynolds' metallurgists, and was thoroughly indoctrinated in the applicable paint finishes by Sherman-Williams' technicians.

Manufacturers of brake forming and roll forming equipment gave him short courses on their products, and he ended his quest certain that roll forming was the better way to make siding.

Alside started up early in 1947, but in no sense could the company's early career be termed a "garage operation." The \$100,000 had been well spent on a 20,000 square-foot plant which housed a pretreating line, one roll former, an electrostatic spraying system and an infra-red bake oven. Reynolds Metals supplied most of the coiled sheet—and still does. The product was 8-inch faced lap siding, hardly different from today's



■ Reynolds Metals Co. had an aluminum home siding project under way as far back as 1945. In this old photo, W. G. Reynolds, vice president of Reynolds Metals Co. (left), and credited with being the prime mover in Reynolds' development of the product, is shown taking Roscoe Dalton, Kentucky State Housing Director (second from left) and Federal Housing Administrator Wilson Wyatt on a tour of inspection of the company's aluminum sided test house. David P. Reynolds, now executive vice president, is shown at right. Jerry Kaufman was in the army when this picture was taken in 1946. He bought his first carload of Reynolds siding for distribution by his contracting firm; was in business as a manufacturer the following year.

simulated clapboard, except that there were but three colors.

Production sequence was to uncoil the aluminum through the conversion coating line; recoil it; uncoil, flatten and punch nail holes just prior to roll forming; cut to length; convey through spray booth; through bake oven; and finally, packaging. Except for many refinements, the sequence is pretty much the same today.

Most of the start-up fund was spent, but Alside still had one big asset: Jerry Kaufman's salesmanship. He and Manual Kaufman started their quest for desirable dealers. Manufacturing and general administration were managed by Arthur Mentall, who had joined the firm as executive vice president and director.

"Convincing building supply dealers that our aluminum siding was worth taking on was the toughest job I'd ever had," Kaufman recalled. "Competition from established siding products was particularly keen."

But the sales prowess of the Kaufman brothers paid off, and in less than a year they had formed the nucleus of a dealer organization and had trained a couple of applicator-instructors. When the year was over, the books showed sales of more than \$1 million.

By 1950, aluminum siding had its foot in the door. Alside, faced with the competition of about four other siding makers, introduced a new product—a 9-inch-wide vertical panel, .025-inch thick and 10 feet high. No world-beater for the salesmen, the new vertical siding was considered a must for homeowners who wanted the unusual—either in new homes or remodeling.

How's Vertical Siding?

The new product added little more than 3% to Alside's \$7 million gross sales that year, but Kaufman wasn't too concerned. Even today, vertical siding amounts to no more than 15% of total industry sales.

The next two years—during the Korean War—were lean ones for the siding industry as the government clamped down on civilian uses of aluminum. But Kaufman found that Alside's products could be sold for farm buildings and even some industrial buildings. Alside's growth was steady. There were five additions to the plant between 1948 and '58 when it was almost totally destroyed by fire.

The following table of the net profits, drawn from a recent Alside financial prospectus, shows the firm's sure-footed

performance in a business that has become increasingly competitive:

1955—	\$ 843,323
1956—	967,373
1957—	728,340
1958—	489,711
1959—	1,204,046
1960—	1,602,537

Despite the fire in 1958, which reduced profits severely, salvaged equipment and new equipment that was being delivered when the fire took place, were installed in rented quarters, and production was resumed after only a five-week shutdown.

If the foregoing suggests a high degree of corporate stability, the Alside picture becomes even more flattering in the light of rapid industry growth. Whereas Alside had the market pretty much to itself in 1947 (AlSCO, Inc., diversified manufacturer of aluminum building products also started up in 1947), some 30 to 40 firms now produce aluminum siding. [A contract manufacturer produces siding for four members of the industry.]

Most of these companies simply buy coiled, bare aluminum, slit to width, which they roll coat and bake-harden prior to forming and packaging. A smaller group of firms buy painted coil and simply roll form and package. In 1960 these outfits consumed about 5000 tons of pre-painted coil, according to Reynolds Metals.

Industry leaders like Kaufman and his neighbor, Harry Sugar, president of AlSCO, Inc., decry this practice, pointing out that quality control is practically non-existent. In rebuttal, A. Jesse Ivanhoe, president of Win-Chek Industries, a young but rapidly growing company in Moonachie, N. J., points out that:

"We use pre-painted material supplied by top manufacturers. We inspect each coil rigidly, rejecting those that fall short of our standards for reasons of oil canning, excessive camber, or other faults. We use the best roll forming equipment, and for these reasons are able to market residential siding of consistently high quality."

Of the practice of forming pre-painted sheet, Kaufman points out that nail slots and weep holes, punched into the sheet before roll forming, are left bare since all the painting has already been done. This is so of the cut edges of each section. Depending on atmospheric conditions in the area of installation, such unprotected parts can corrode later on, he said.

Thus, the broad base of the residential siding industry is a large group of unintegrated fabricators who start with specification sheet or building sheet, then paint and form, or buy pre-painted sheet and form it. Alside forms the metal first, then spray paints.

(Continued on page 50)

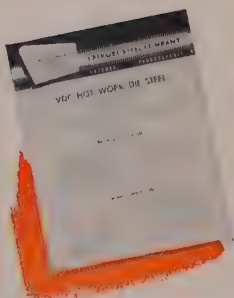
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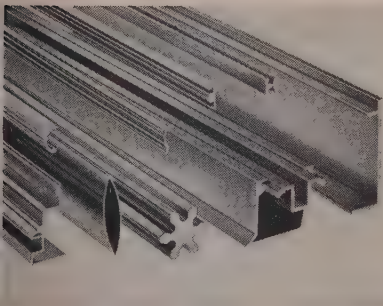
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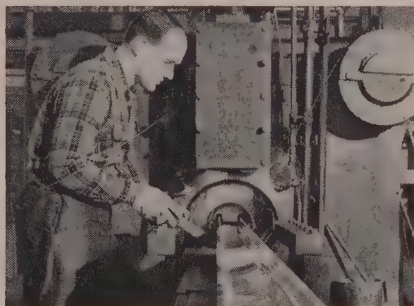
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Name _____ Title _____

Firm _____

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■ Before-and-after shots of this old homestead show how aluminum transforms a house—permanently. Built in 1820 near Charlotte, N. C., the old place probably had three wood siding jobs in its long life. National Metal Products Co., Pittsburgh, Pa., supplied the aluminum for its last siding job.

At present there are only two integrated independent siding manufacturers. Alcoa, Inc., considered the second largest manufacturer in the industry, melts ingot to produce its own rolling slab, then hot rolls the slab, cold rolls, slits to width, roll coats and forms.

Consolidated General Products, Inc., Houston, Tex., is the other integrated siding manufacturer. This five-year-old company melts aluminum ingot, which it then casts into 2000-pound coils of ¼-inch thick, 32-inch wide sheet on its two continuous sheet casting machines, built by Hunter Engineering Co.

The quarter-inch-thick coils are cold rolled to .050-inch by a single stand finishing mill, annealed, then cold rolled again to final thicknesses from .040 to .010-inch.

Of course, Alcoa has the greatest backward integration for the production of siding. Here the product is 8-inch faced, made of alclad aluminum, backed by a factory-applied self-extinguishing polystyrene insulation and stiffener, and by aluminum foil for reflective insulation.

Alcoa roll coats, then roll forms its

product [there are claims that the siding is still manufactured on contract by an unknown siding firm], then ships it to five big building products firms who, all told, supply some 25,000 dealers and dealer-applicators.

Sheet Mills Stay Aloof

Beyond Alcoa, no other producer of aluminum sheet seems to be contemplating entry into the siding business—at least not in the immediate future.

Producer A said: "We have not been in the aluminum siding business either as a supplier to siding makers or as a manufacturer. We do not contemplate any activity in this area during 1961. The market would not be a profitable one for us. . . ."

Sheet producer B sold about 600,000 pounds to siding manufacturers in 1960, some 500,000 pounds in 1959, and expects to sell them 2 million pounds this year. As of year's end, this sheet mill had two siding manufacturer customers: it sold them slit stock in their own version of building sheet.

"We have found price competition is severe in this market," producer B remarked.

Producer C reports that its only interest in the residential siding field is to "continue to supply siding manufacturers with painted or unpainted coil. We have no desire or plans to manufacture residential siding, which would make us competitors of our customers."

Producer D hopes to be selling siding makers some time this year, though it hasn't been able to so far.

Producer E did little or no solicitation of the siding industry in 1959 and '60 but sold a few siding companies about 1 million pounds at the full book price, and expects to sell 5 to 10 million to siding makers this year.

"I think price competition in this market is greater than in any other market in the U. S.," a spokesman for this sheet mill said. "We have always been large suppliers to the consumer durable goods industry, where there is not nearly as much price cutting or deals as is in the siding industry."

This executive said that the few siding companies who occasionally bought coiled sheet from them at book price also bought elsewhere at "special prices."

This company has no plans to manufacture siding in 1961. "However, if competition and the market develop and we feel in order to make a profit in the siding field it will be necessary for us to eliminate one of the middle men, we would consider making our own siding for resale through distributors, jobbers and lumbermen."

Kaiser Aluminum, Olin Aluminum,

and Reynolds Metals so far have eschewed production of residential siding, but leave the door open in case future developments make it necessary for them to jump in. These companies and Alcoa produce painted aluminum coil.

That the market for siding sheet continues to grow was well established in replies to a spot survey of the industry by Modern Metals. Total estimated consumption of coiled sheet in 1961 by 12 siding makers amounted to 66,125 tons—nearly 36% more than the 48,650 tons consumed by these companies in 1960.

Ten of the 12 indicated an increase in consumption of some sort; only one gave a reduced estimate; and one expected the same tonnage this year as last.

In the total of 45 different siding products marketed by 13 companies, 25 are made of building sheet; 15 use 3003 sheet; and five are made of alloy 5005.

Most makes of horizontal lap siding look alike, though experts could probably tell one company's product from another's. It is usually sold in widths ranging from 7 to 10 inches, and in lengths near 12 feet. A fairly new development is "double 4" clapboard," an approximate 8-inch facing bisected by a step-down to simulate two 4-inch boards.

Most insulation is fiberboard, quite heavy and not quite as good as the self-extinguishing polystyrene used on Alcoa siding. This latter type of backer board is also very light. Alside makes and uses both types of insulation.

Last year the FHA gave its approval for the use of .019-inch thick aluminum siding on FHA-financed home improve-



■ Some of Alside's 8-inch aluminum home siding being installed.



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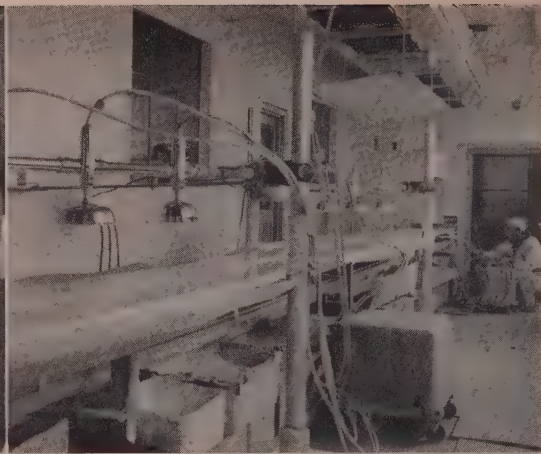
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■ Siding is formed with press brakes at Altex, Inc., Waukesha, Wis. (left). Two men at right are shown feeding 12'8" punched and levelled blanks to give top profile to each piece. Accumulated blanks are then moved to press at left for addition of

bottom part of profile. Brake forming method might be more inviting for siding makers if a workable die could be made to produce both formed edges in one press. Photo right shows Altex siding getting two coats of electrostatically applied paint.

ment and new construction jobs, stipulating that such siding be backed up and have a minimum tensile strength of 20,000 psi.

While the approval didn't cause any major change in favor of the thinner material, there were localized moves in its direction. It's safe to say that the hollow siding is still the big seller.

Vertical siding at least has the virtue of having outgrown the simulated batten board design, achieving a limited distinction of its own. Widths range from 7 inches or so up to 12 inches; heights from 9 to 12 feet. Vertical siding, with its wide, trapezoidal rib, or V-groove is distinctively "non-wood" if not distinctively aluminum.

Alside's Products

Siding accounts for approximately 85% of Alside's total sales. The company also produces a full line of accessories, such as gutters, downspouts, window and door channels, shutters, profile corners, and caulking compounds. The plant also produces Air-Cushion foil, used for home insulation; and Strata-Foil, an insulated "sandwich" panel of siding to which layers of polystyrene foam and Air-Cushion foil are added.

The company's horizontal lap and vertical siding have the brand names, "Alside," "Aluma King," and "Life-wall." Alside claims to be the only company producing each of its siding products in 14 different colors, with either a smooth or embossed finish.

Briefly, Alside's manufacturing today involves cleaning bare aluminum coil, then Lyfanzing to prepare the surface for finishing. The sheet is coated with a protective backing, then a base coat of primer is rolled on.

After priming, the sheet is uncoiled through a flattener; nail and weep holes

are punched; and the siding panels are roll formed and cut to length. The prime coat eases the metal through the roll former. Electrostatic spray painting is done next on an Alside-designed spraying system, after which the enamel is baked in gas fired ovens. Addition of backer board, if called for, is the last manufacturing step.

Kaufman is very positive in defending his choice of methods. Brake forming cannot compare with roll forming for speed, efficiency and economy, he believes.

"We have machines here that run at 285 feet a minute," he asserted. "I don't think any brake could match that. And even running considerably slower, our 12 roll formers can produce siding at a clip that enables us to spray paint about 900 feet a minute."

From an operating cost standpoint, Kaufman believes that a brake forming operation might require 2.5 times as much manpower as a roll forming operation of equal capacity.

Brake Vs. Roll Form

A debate between Kaufman and Harvey A. Arndt, plant manager of Altex, Inc., Waukesha, Wis., would be interesting if not conclusive. Altex, one of the two companies that brake form siding, receives mill finish, cut-to-width coils, 11 inches wide, .019-inch thick, weighing 1000 pounds. The coils are first run through a conversion coating line (Bonderite 721), after which the metal is recoiled.

The coil is then moved to a cutting, flattening line in which blanks 10-feet, 8 inches long are cut. Before the metal is cut, however, it moves under revolving dies which punch nail and weep holes in the edges. The operator pulls the cut lengths onto a camber gauge before stacking.

"The 10 foot, 8-inch lengths are for a 16-inch module which is used in 90% of the siding jobs," Arndt said.

The blanks are then hand fed to the two brake presses. The first press produces the profile on one edge of the blank, after which the second press forms the other profile. Timed, about 276 feet of siding blanks pass through the first press in one minute. Electrostatic spraying and baking of the Dura-cron acrylic enamel are next.

"We produce a minimum of 62,400 lineal feet of finished siding per shift," Arndt said. "All siding coil, regardless of source, has a camber of about 1/16 to 1/8-inch in a 10-foot length," Arndt said. "This doesn't concern us because press braking hides the camber, taking up the variation on the nailing edge and on the unexposed part of the butt edge."

Arndt claims that malfunctions in brake forming are likely to cost less in time and material than in roll forming. "When a brake gets out of whack, only one panel is involved but a malfunctioning roll former can ruin a lot of footage before the fault is discovered."

Kaufman discounts this, saying that in 13 years of operation Alside's roll forming scrap has been very small.

"In press braking," Arndt contends, "springback is negligible—perhaps no more than 1° on the extreme bends. That's why we can use 3/4 hard or full-hard temper."

"In roll forming, a consistently uniform temper is vital. To allow for an 8° springback regularly and then run coil that produces a 3° springback would create irregularities in the siding."

Kaufman, on the other hand, asserts that Alside consistently gets the 3/4-hard temper it requires, makes the

(Continued on page 56)

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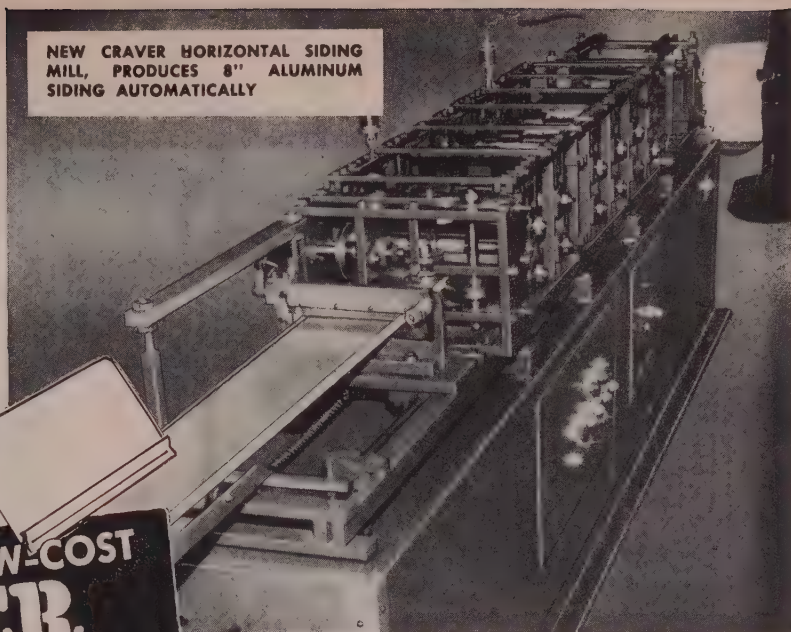
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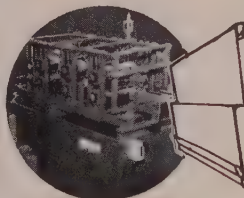
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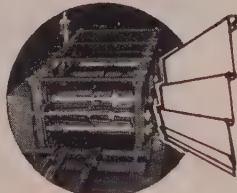


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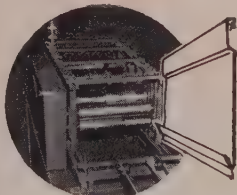
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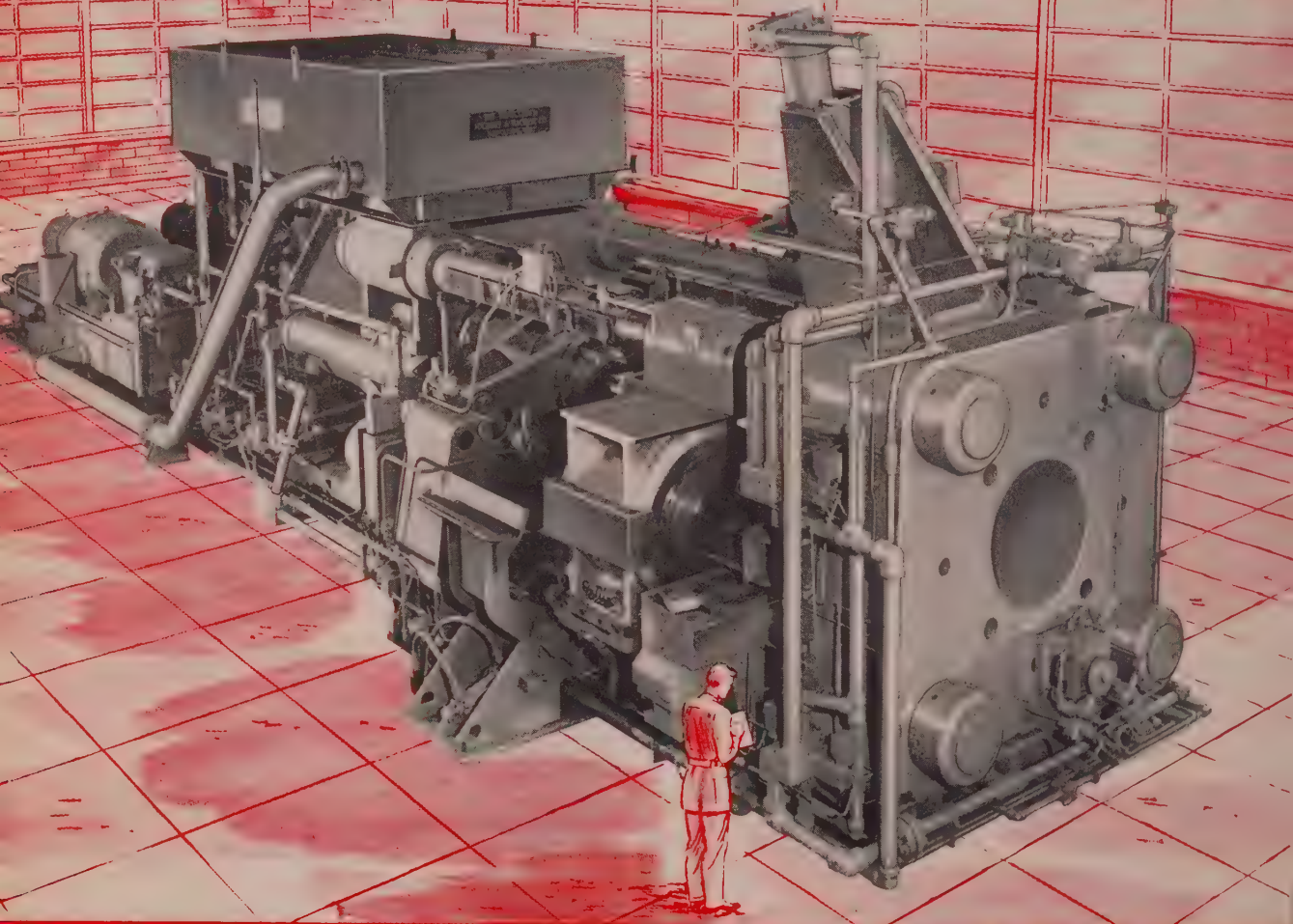
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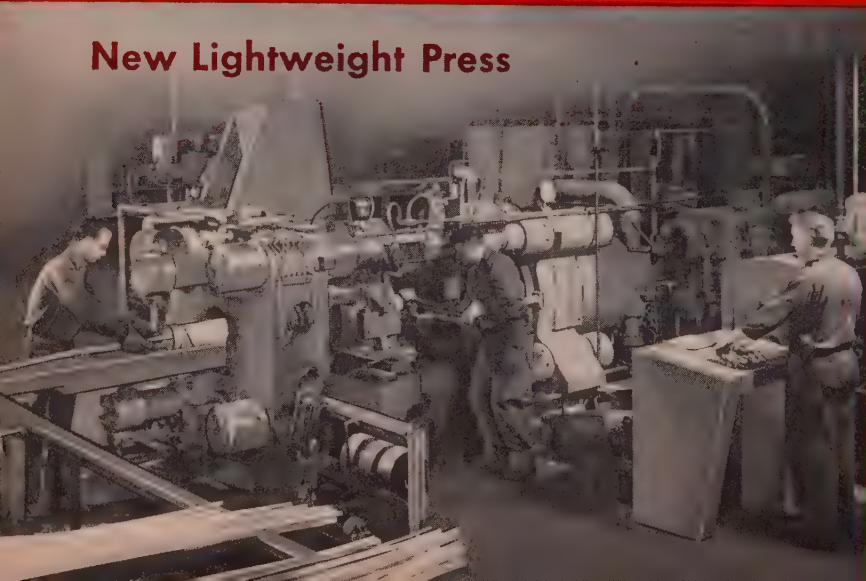
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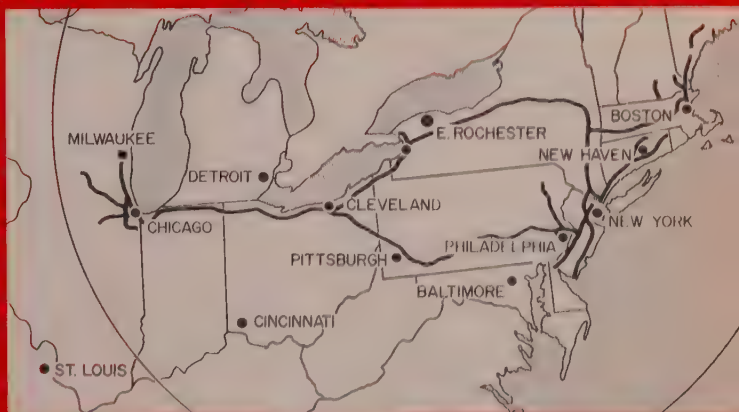
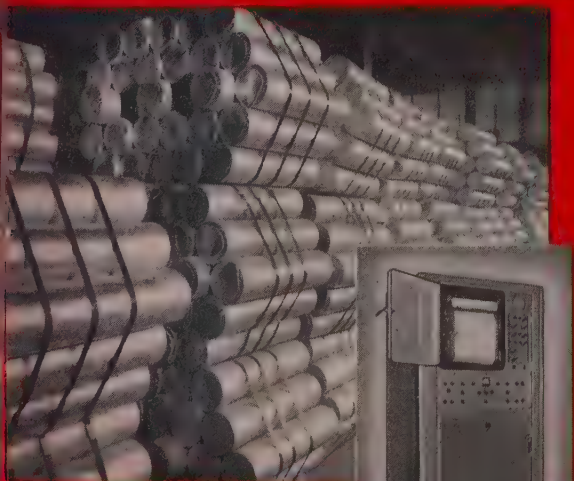


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appropriate allowance for springback, and has no difficulty.

"There isn't much difference in the cost of roll formers and brakes," Kaufman said. "So the basis of any judgment for or against should be the man-hours the equipment demands."

Roll Forming Machines

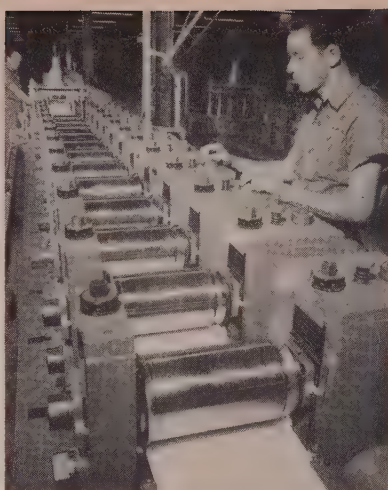
When it comes to paying the price, one has wide selectivity in roll forming machines. Operating speeds of 50 to 100 fpm are usual in the industry, though standard machines of some of the larger manufacturers are designed to operate much faster.

"The manufacturer has a choice of roll forming machine sizes to match the speed of his roll coating line, or his spray painting operation," said W. M. Truska, Jr., general sales manager of The Lockformer Co. "Most companies, like our own, can supply a highly efficient, 14-station roll former for about \$8400."

This model would produce 8-inch aluminum siding in a conventional profile at 50 to 100 fpm. Other features are an arc-welded stand; precision hobbled and case hardened gears; hardened and ground roller shafts; Zerk type grease fittings for each bearing; and an entrance table that guides the metal through the machine.

A complete set of roller dies for forming 8-inch siding are chrome plated to permit the use of pre-coated metal. Rolls are arranged to punch the nailing slot and weep hole in the profile. Either coil or cut-to-length stock can be run.

The machine comes equipped with a 5 h.p. 1800 rpm motor and "across the line" starter for operation on 220/440 volt, 3-phase, 60-cycle current. Special rolls mounted to the auxiliary



■ This 14-station Ardcor roll former is shown in siding production at Crown Aluminum Industries.

shafts can be used to produce other shapes used in the siding industry—inside corners, outside corners, starting strip, door and sill trims, etc.

A machine having a production of up to 180 feet of home siding a minute is made by Michigan Roll Form, Inc. of Detroit 28. The unit is available with roll shaft diameters of 2, 2¼ and 2½ inches and is a 12-station machine.

"Model RMT-200 is capable of sustained production at 180 f.p.m. and better, provided MRF dies are used," a Michigan Roll Form spokesman said. "The machine is especially designed for siding production and is powered for steady production at this high rate—shift after shift."

Alcoa's massive entry into residential siding has caused some analysts to move Crown Aluminum Industries, Inc. back to fourth place in order of annual pro-

duction. Nevertheless, Crown appears to be a factor of increasing importance in the field.

Crown — Fast Growing

This company, headquartered in Pittsburgh, Pa., with a large, modern plant in Roxboro, N. C., started up in 1958 and grossed \$2,500,000 in the first full year of operation. Sales totaled \$5,500,000 in 1959, and topped \$10,000,000 last year.

Crown, like several other large siding manufacturers, prime coats its siding, then bakes; follows with a finish coat, and bakes this.

Next, the enameled aluminum strip leaves the paint line and enters the roll-forming machines which form it into the required shape for horizontal or vertical panels. Roll forming speed is 100 to 200 fpm.

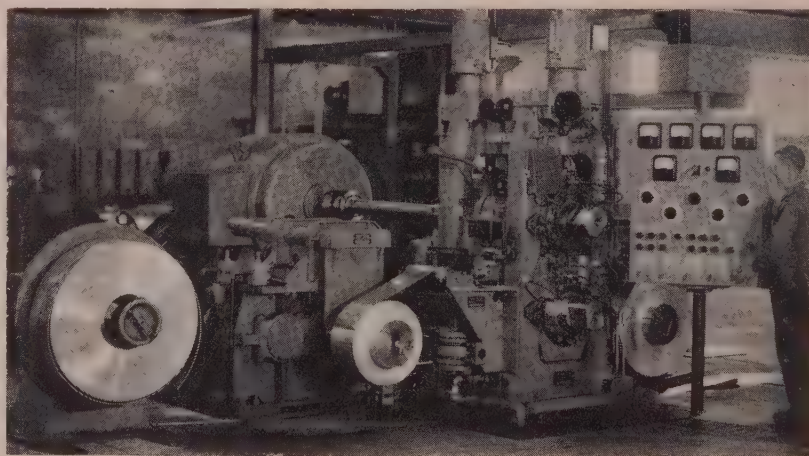
American Roller Die Corp., Wickliffe, Ohio, supplier of five of the roll forming machines at Crown Aluminum, said that equipment used in the production of pre-painted aluminum siding ranges from a 1½ to 2-inch diameter spindle, and from 12 to 16 stations, depending upon the type of siding being produced.

Ardcor cites a price range of \$34,500 to \$45,500 for a complete siding production line composed of:

1. Coil holder
2. Ardcor Model 1-F roll forming machine
3. Complete set of rolls
4. Ardcor 4-post under-drive cut-off press
5. Flying type notch and cut-off die
6. Runout table with mechanical trigger.

Floor space required for this installation would measure 10 feet wide by 60 feet long.

(Continued on page 58)



■ Alsco, Inc., Gnadenhutzen, Ohio, second largest producer of aluminum home siding, has fully integrated facilities; buys ingot, melts it for the production of rolling slabs shown (left) in the early stages of reduction to re-roll thickness. Alsco's cold rolling operation is shown at right.



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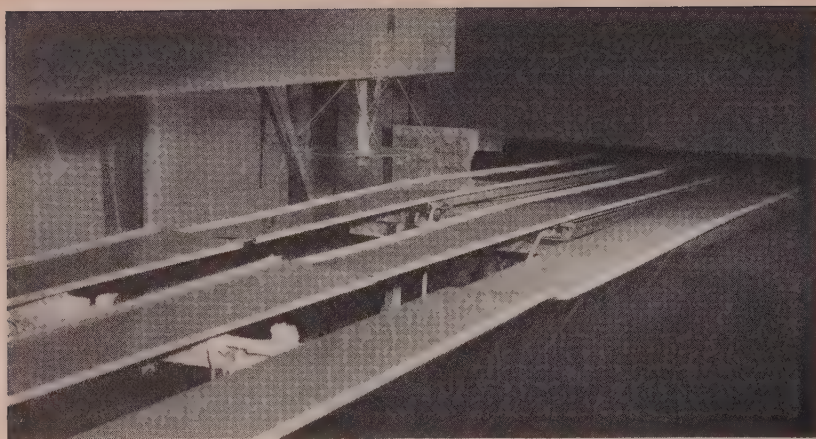
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■ Aluminum home siding being painted by electrostatic method at the plant of Enamelled Steel & Sign Co., Chicago. The sheet has been roll formed and cut to length prior to painting. The painting technique gives uniform dry film coverage.

"Roll forming has the advantage of being fast, continuous, accurate and recognized for uniformity of shape," an Ardcor spokesman said. "The cost of a complete set of siding rolls ranges from \$5750 to \$14,000, depending upon width of section. Some manufacturers maintain two sets of rolls and two notch and cut-off dies for each siding line, using one set while the other is being reconditioned."

Ardcor figures that a set of rolls will produce about 12,000,000 feet of pre-painted siding before they need re-grinding. Generally, a set of rolls lasts about four years.

A single machine, called "Side King," is the product of Flexolite Mfg. Corp., Schenectady, N. Y. This 14-station roll former is set at 75 fpm because Jack Lazarow, Flexolite president, believes that to be the most practical operating speed for economy and minimum manpower.

"Side King pre-punches the nail holes, pre-notches and pre-punches a louvered vent in one continuous operation, ready for application or packing," Lazarow said. "It is so designed that aluminum from .019 to .040 inch thick can be run with minimum adjustments."

Growing demand for the 8-inch siding prompted Flexolite to aim squarely at this size in the design of the machine, which carries a price of \$12,000. Besides the complete set of dies for siding, Flexolite also includes rolls for door and window trim, inside corners and starter strip.

At the top of the production scale are such machines as Yoder Co., Ardcor and Tishken, high speed units that run better than 200 fpm. Alside, however, has redesigned some of its Tishkens to run at 285 fpm, which explains why the bulk of Alside's engineering program is concentrated on the spraying and baking systems.

Localized Manufacturing

A young industry is a changing one. Despite the views of Kaufman and Sugar, there is a decided trend in the direction of localized siding manufacture, with the formation of companies whose only investment, at least at the outset, is the purchase or lease of a roll former.

Several roll forming machine manufacturers concentrate on these newcomers to the siding business; one of the leaders is Craver Industries, Inc., Charleston, S. C. This firm sells a high-speed roll former designed specifically for 8-inch horizontal aluminum siding production.

The siding producer who buys Craver equipment will be trained by experienced siding applicators; will be introduced to packaging and distribution phases; and will purchase pre-painted aluminum coil.

Craver points out that local manufacture cuts inventory and warehousing costs, as well as shipping and special quantity "rush" costs. To give its customers a degree of versatility, Craver offers converters — tools which enable the siding maker to produce double-4, 2-on-8 step-down panels for carport roofs and awnings, and vertical board and batten siding.

Roliton Corp., Denver, Col., has returned to the field with a mobile siding machine designed to be leased by applicators and dealers who would then form standard 8-inch siding at the job site from pre-painted coil.

There have been other changes along more conventional lines. Siding makers who have depended on contract manufacturing for their product are moving in the direction of self sufficiency. At least one company will break ground for its own manufacturing plant this year, while another has already launched itself. This latter firm is the Seaway

Products Div'n of Globe Industries, Whiting, Ind. Seaway's siding plant is in South Chicago, producing 8-inch horizontal siding, and vertical siding in 9 $\frac{5}{8}$ -inch and 10-inch widths.

Seaway Products estimates a satisfactory gain in production this year, compared with five months operation last.

Finishing, Processing Lines

To the ultimate consumer, finish is the factor that matters most. Whether he is buying aluminum siding for his present home, or a new home clad with aluminum siding, the initial appearance and long-term durability of the coating system are—or should be—his primary concern.

It is not surprising, therefore, that the aluminum siding industry's most outstanding technological advances have occurred in the three areas that affect the final finish: Pretreatments (usually chemical conversion coatings); coating methods (primarily roll-coating or electrostatic spray); and finish coats (alkyd, vinyl, acrylic, etc.).

The words "paint" and "enamel" are inadequate terms for the carefully formulated organic coatings that are applied to aluminum siding today. Like enamels, however, they consist of three principal components: The pigments, which impart color, hiding power and texture; the vehicles, or resins, which serve as carrying media; and the solvents, which dilute the vehicles to the proper consistency for the application method to be used.

Coatings are classified according to resin, the principal ones being alkyd, vinyl and acrylic. Since most of the major paint manufacturers — Sherwin-Williams, Interchemical Corp., De Soto Chemical Co., Pittsburgh Plate Glass, etc.—carry a complete stable of coatings, they generally are objective with respect to the relative merits of the alkyd, vinyl and acrylic systems.

Of these three systems, alkyd is the old-timer, having been used on siding for some 15 years. Alkyd coatings bake-cure quickly to a very hard, durable film—an advantage in siding, since the film is less susceptible to dirt pickup resulting from windblown particles.

With their high solids content, the alkyls cover solidly in a single coat. They are easily applied and they flow out smoothly. Strip metal that has been roll coated with alkyd enamel can be recoiled hot without danger of "printing" or abrasion damage.

Color retention of alkyd coatings is good, and whites can be formulated to chalk moderately, thereby becoming partially self-cleaning. The alkyls can be modified with other resins to improve their resistance to alkalis.

(Continued on page 61)

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wheel grinding – surface grinding – belt grinding – polishing – belt polishing – belt lubrication – buffing – coloring – satin finishing – scratchbrushing – barrel finishing – sand or vapor blasting – choice of equipment, abrasives, buffs, compounds.

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caustic etching – desmutting – chromate conversion coating – phosphate conversion coating – phosphate-chromate conversion coating – modified Bauer-Vogel process – bright dipping – British and German brightening methods – chemical polishing.

ANODIZING, PLATING ALUMINUM

pretreatment – electrolytes – coating characteristics – operating conditions – racks – coloring – sealing – hard coating – built-in colors – electroplating – special considerations – plating metals – electroplating processes.

ORGANIC COATINGS FOR ALUMINUM

cleaning methods – surface pretreatments – primers – etch type primers – types of finish coats – spray painting – hot airless spraying – airless electrostatic spraying – steam spraying – roller coating – dip painting – flow coating – baking – drying.

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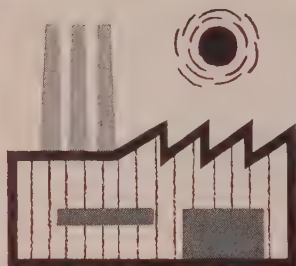
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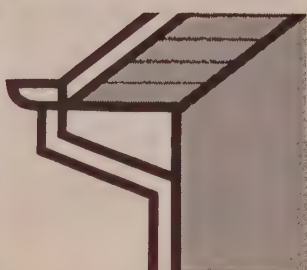


ALUMINEWS



FOR INDUSTRIAL SIDING

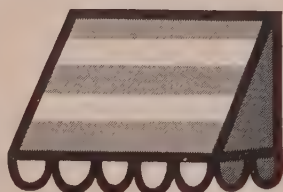
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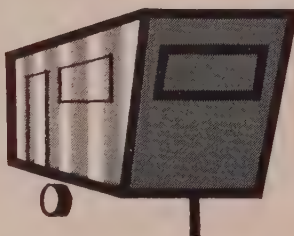
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The main disadvantage of the straight alkyd coating is its relatively poor formability. The film continues to cure after baking, thus growing progressively harder and less flexible. This is a distinct drawback, particularly if siding is to be formed from precoated stock and incorporates the sharp bends associated with most interlocking siding systems today.

The vinyl-base coatings, on the other hand, boast first-rate formability—can take sharp bends without cracking or flaking—and they retain their flexibility over long periods of time. Sherwin-Williams Co., one booster of these coatings, reports that samples of its Superclad 500 thermoplastic vinyl enamel have been formed after aging for more than eight years—"and its formability was in no way way decreased."

The vinyls adhere well to properly prepared metal surfaces; their color retention is at least as good as that of the alkyds; they provide superior resistance to industrial atmospheres; and their durability is good, especially when they are modified slightly with other resins.

Since the vinyls are generally lower in solids, a thicker wet coat is needed to obtain adequate dry film thickness. Thus, the cost per square foot of coated surface is slightly higher, even though the per-gallon cost may be on a par with that of the alkyd enamels. On the other hand, the vinyls rarely require a primer.

The closest thing to a "disadvantage" of the vinyls is the comparative softness of the film. Siding coated with vinyl enamel may have a greater tendency to accumulate windblown dust and dirt, especially during hot summer weather. Also, vinyls tend to be more susceptible to discoloration during the bake cycle if the line stops or the temperature control goes haywire.

Acrylics Battle Vinyl

Vinyl enamels, with their proven advantages over the alkyds, appeared to be well on the way to dominance as the finish for siding until about a year and a half ago, when the acrylics appeared on the siding scene. After an apparent triumph in the automotive field, acrylic enamel made an impressive debut in the siding business when National Homes Corp. revealed that its 1960 line of prefabricated homes would be clad with acrylic-finished aluminum siding.

In its high-powered advertising and promotion campaign, National Homes played the acrylic theme for all it was worth, declaring the finish to be "The greatest home paint discovery in 100 years." Since then, the acrylics have deepened their inroads in a market once controlled by vinyls and alkyds.

Among the paint manufacturers who



■ At Crown Aluminum Industries, Roxboro, N. C., coiled aluminum is being given a top coat and a back coat as it passes through a Ross-Waldron strip coating line. Alside and Crown both (and doubtless other siding companies) use this dual applicator equipment.

are pushing the acrylics are De Soto Chemical Co., and Pittsburgh Plate Glass Co. Last month, the latter unveiled its new Duracron thermosetting acrylic enamel, developed expressly for aluminum siding. PPG asserts that Duracron affords greater durability, better color retention, and longer life than any other single-coat organic baked film designed for siding.

Acrylic enamels are claimed to have unrivaled color retention and superior durability in exterior exposure. "We think it's pretty well established that in the acrylics the pastel shades most closely associated with the housing industry have less bleaching out over the years," declared R. R. Missar, sales supervisor of De Soto Chemical. Gloss retention of the acrylics is also superior to that of vinyls and alkyds, he said.

But this enthusiasm for the acrylics is not unanimous. Sherwin-Williams points out that it, too, offers a thermosetting acrylic enamel, the salient prop-

erties of which include outstanding color and gloss retention in outside exposure, a very hard thermosetting film, excellent hot hardness and adhesion, very high resistance to detergents, and excellent resistance to salt spray, humidity, water immersion, and solvents.

But Sherwin-Williams seems to consider these properties as "still unproven," pointing out that favorable test results "cannot be correlated, beyond a moderate point, with actual exterior durability over a long period of time."

The chief deficiency of acrylic films is their poorer formability. In this regard, Sherwin-Williams ranks them somewhat better than the alkyds, but not as good as the vinyls. De Soto Chemical's R. R. Missar agrees, noting that "there is nothing on the market now that will beat the vinyls for their ability to form without breaking."

Organosols Vs. Plastisols

Other newcomers to the finishes field are the organosols and the plastisols. The former are vinyl based dispersions which, unlike solutions of vinyl resins, are carried in vehicles made up of solvent and plasticizer. At curing temperature, the solvent-plasticizer dissolves the vinyl dispersion, thus combining the pigment, plasticizer and resin in a protective film.

Since the organosols have higher solids content than straight solvent vinyl systems, their cost is lower.

A least one siding manufacturer is known to be using organosols, which it applies by electrostatic spray to siding components that have been brake press formed from prime-coated stock.

Plastisols are dispersions of high molecular weight vinyl resins in plasticizer. At curing temperature, the plasticizer takes the vinyl resins into solution. The resulting coat is tougher and more durable, flexible and resistant to chemicals than the solution vinyl film, but it is not as hard. Because of its very high solids content, the plastisol is the most economical of the vinyl coatings.

The choice of enamel for aluminum siding is often dictated, in part, by the

Comparative Costs of Siding Enamels (One Mill Film Thickness at 100% Paint Efficiency)

Enamel	Price per Gal.	Coverage,	Cost Per 100 Sq. Ft.
		Sq. Ft. Per. Gal.	
White Vinyl	\$ 3.75	272	1.45
White Gloss Organosol	1.60	575	.886
White Alkyd Amine	4.45	735	.775
White Vinyl Alkyd	4.95	520	1.04
White Flat Organosol	4.75	530	.980
White Acrylic	5.10	288	1.95

coating process employed. Most, if not all, siding producers use one of two principal application methods—roll coating or electrostatic spray. The former is usually done before roll forming; the latter after the siding has been fabricated.

The roll coating and roll forming approach usually dictates use of an enamel with good fabricating properties, such as the vinyls, which, with their excellent elasticity, have been favored among siding firms that roll form after applying the finish. Some of the new acrylics are moving in on this segment of the industry, however.

Electrostatic Spraying

Application of the finish by electrostatic spray is usually favored by those siding makers who apply the enamel after the siding has been formed. In this case, it is possible to take advantage of the superior durability and color fastness of the acrylics without being concerned about damage to the enamel film during fabrication.

While roll coating is the most popular method of applying paint to siding, Alside uses an electrostatic spray system. Claims made for this technique are that it consumes paint sparingly, gives a consistently uniform finish, and requires less help than hand spraying (but certainly no less than roller coating).

In the case of a Ransburg system (this is not used by Alside), the siding would be moved on a grounded conveyor into a coating zone where an electrostatic field is created between siding and an atomizing head—a bell or rotating disc which is charged to a high static potential. Atomized coating material is directed from this head to the work surface.

The paint, in being delivered from the head, becomes charged to the same polarity as the head and opposite to the polarity of the work. Just as opposite poles of a magnet attract, the coating material particles under the influence of the field are attracted toward the work and deposited on its surface.

Today's highly versatile paint finishes have encouraged the use of roll coaters. The fact that chrome plated roll forming rolls have no ill effects on finished siding* also makes pre-painting a convenient production line arrangement.

The roll coater (for description, see article on page 82) has an applicator head which applies the coating in a regulated quantity from a pan of coating material. The applicator roll moves in the opposite direction of strip travel, thus achieving a squeegee effect which

gets the best paint mileage. Big siding plants have dual head applicators which allow changing of color in less than 10 feet of coil passage. Micrometer adjustments in the rolls permit application of various film thicknesses.

As in the case of most other enameled aluminum products that are exposed to the weather, siding is first cleaned and conversion coated to tighten the paint bond and enhance the metal's resistance to corrosion. Several major suppliers of conversion coatings serve the siding industry.



■ Vertical aluminum siding is latest addition to Alcoa's residential siding line. It's designed to harmonize in style and color with Alcoa's 8-inch clapboard siding. Another Alcoa siding product is Colorib, corrugated panels in 48-inch widths and three lengths, and seven colors.

Allied Research Products, Inc., Baltimore, produces three treatments, under the copyrighted name, "Iridite," for various operating conditions. For coil operations, Allied recommends Iridite No. 14-5, applied by immersion or spray. It produces a clear to a deep brown coating.

"Iridite No. 14-5 is supplied as a completely balanced powdered compound which is used both for make-up and replenishment," Allied Research reported. "Optimum concentration of coating forming ingredients allows operation at minimum solution concentrations and minimizes the cost of drag-out losses."

Automatic pH Control

Allied Research developed automatic pH control for use with this product to allow flexible automatic control of the weight of coating being developed.

"The advantages are important," the company said. "If the coating weight can be controlled to ± 5 milligrams of

coating per square foot, appreciable economies and consistent quality can be effected."

Included in the line of Amchem Products Inc., Ambler, Pa., is the Alodine 1200 Series. All three of this series, Alodine 1200, 1200S and 1200T, produce a hexavalent chromium film.

Alodizing occurs in the third stage of a representative cleaning line to produce Alodine weights of 25 to 35 mg/sq. ft. of surface. Past experiences indicate that this range is optimum insofar as quality and costs are concerned, the manufacturer said.

"The primary objective of using Alodine 1200 is to improve paint bonding characteristics and permit subsequent roll forming of the painted strip," Amchem Products said.

Neilson Chemical Co., Detroit 20, supplies a conversion coating called Lyfanite A-520. Especially compounded for spraying in a continuous coil strip operation, it may be applied between room temperature and 130° F. The strip may be processed at speeds of 50 to 300 linear feet a minute.

"The color and depth of the coating can be varied either by increasing or decreasing the concentration, the temperature, or the duration of treatment," Neilson said.

Oakite Products Inc., New York, has Chromicoat, a chromate conversion coating which develops a range of colors from golden yellow to iridescent yellow. Shade produced is governed by alloy of aluminum, surface condition (etched or not), cleaning method, concentration of the solution and length of time applied.

Oakite Chromicoat comes in powder form, dissolves in warm water at concentrations between 1 and 3 ounces per gallon, depending upon method of application.

Regardless of the finish used for aluminum siding and other aluminum products, surface of the metal should receive a uniform chemical conversion treatment prior to painting, according to Parker Rust Proof Co., Detroit.

Parker points out that increased adhesion and durability of organic finishes applied over chromate conversion coatings on aluminum is well recognized.

"The continuous production of such coatings on aluminum results in a buildup of aluminum and chromium salts (reaction products) in the treatment solution," Parker explained. "Unless the build-up in the bath of these reaction products is controlled, the solution becomes less active and, when continued in use, results in non-uniform coatings and interfering sludge develops."

"To control the build-up of reaction products in the Bonderite 721 process [one of the Parker Rust Proof con-

*Microfracturing of paint finishes by roll formers is not considered harmful.

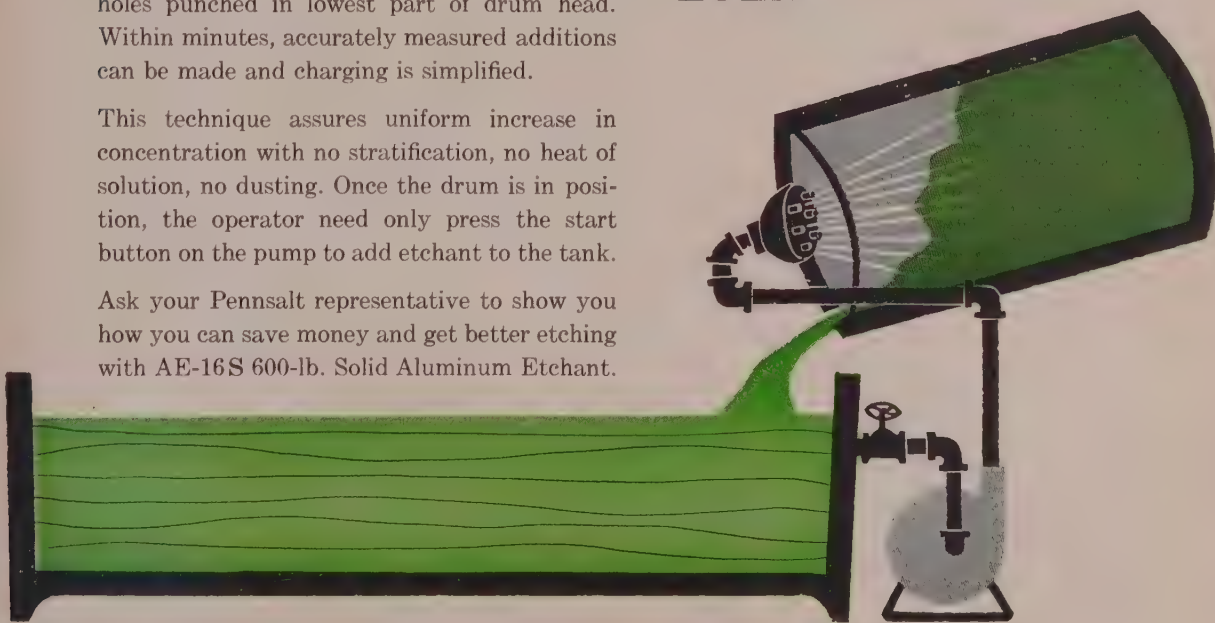
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This technique assures uniform increase in concentration with no stratification, no heat of solution, no dusting. Once the drum is in position, the operator need only press the start button on the pump to add etchant to the tank.

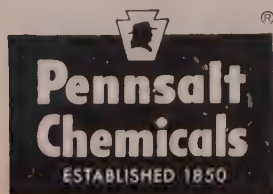
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**Since 1948, Amchem ALODINE*
treated over 1½ Billion square feet**



Popular Reynolds Colorweld pre-finished aluminum panels find wide application in commercial construction where its enduring performance and good looks are helping to change the architectural face of industry. Alodine contributes its protective qualities to Colorweld's amazing paint performance.

Conversion Coating Chemicals have of Aluminum in Reynolds Plants!

From 1955, when Reynolds Colorweld** Production was started, Reynolds has used ALODINE; Continue to Report Complete Customer Satisfaction with Paint Adhesion on this Quality Pre-Enameled Aluminum Product

At two Reynolds producing facilities—Atlanta, Ga. and McCook, Ill.—Alodine chemicals used in the pre-paint treatment of Colorweld offer a typical example of Reynolds' continuing emphasis on product quality.

Each day at these plants thousands of feet of aluminum are treated with Alodine to provide the metal with a chemical coating which produces high quality paint bonding characteristics so essential to the durable Colorweld finish Reynolds demands.

Alodine provided the first economical treatment that made possible the mechanical forming of pre-painted aluminum. Under extremely high volume processing speeds, the outstanding attributes of Alodine benefit

aluminum products of all types—through improved paint bonding for subsequent mechanical forming operations, that means extra years of wear for painted aluminum under all types of environmental conditions.

Behind the success of Alodine as the outstanding pre-paint treatment for aluminum stand the research and development activities of Amchem's Metal Protection Laboratories where the search continues for even more efficient aluminum treating chemicals.

Take a lead from the leaders. If you're producing aluminum—bare or coated—specify Alodine for the assured quality and added beauty of your finished product.

*Amchem's registered trademark for its conversion coating chemical for aluminum.

**Colorweld is a registered trademark of the Reynolds Metals Company.



Beauty and durability characterize Reynolds Aluminum siding of Colorweld for home use. Alodine chemicals help provide a paint bond that lasts and lasts.



This home-on-wheels has more appeal, will last longer thanks to its Reynolds Aluminum Colorweld body—and a firm paint bond thanks to Alodine.



At Amchem's Metal Protection Laboratories exhaustive quality control testing assures the performance of Alodine chemicals for every aluminum pre-paint requirement.



ALODINE

Amchem is a registered trademark of
AMCHEM PRODUCTS, INC. (Formerly American Chemical Paint Co.)
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Write for Bulletin 1424C, gives detailed technical specifications on different Alodine chemicals available for pre-treating aluminum.

version coatings] a portion of the solution is circulated through a cation exchange unit (Parker Reactifier) to remove the aluminum and chromium salts. When the ion exchange resin is saturated, the unit is regenerated, and the column is ready for re-use.

"Such ion exchange units have been in use for controlling impurities build-up in Bonderite 721 for over three years without deterioration in the cation resin efficiency," Parker Rust Proof reports.

With more than 40 million single family residences in the U.S., it's obvious that the home improvement market is an enduring one. This market can be expected to remain on an even keel for a long time to come.

Sales for new construction have naturally been considerably smaller, as the accompanying table shows, but now there are many signs that the siding industry means to win a greater share of this business. Alside, for example, has already formed a new department devoted exclusively to new construction sales nationally.

"We now have 10 men who call only on builders," Kaufman said. "We are increasing this number as fast as we can, and will probably stop at 30."

Mastic Corp., South Bend, Ind., a veteran member of the building products industry and one of the five nationwide distributors of Alcoa's residential siding, has definite plans to enter the new construction field.

"Our sales for years have been to the home improvement market," said Nelson Blair, vice president in charge of sales. "Now we are expanding to include sales of siding and other products to the building materials dealers and lumber dealers, who sell to the builders."

Blair believes aluminum siding will soon win the acceptance in new construction that it has in the re-siding field, noting that many mass project builders are getting their feet wet in the use of what is to them an untried product, and find that they like it.

Kaufman is the first to point out that many factors have combined to speed up aluminum siding's recent acceptance,

including the millions spent by Alcoa, Kaiser, Reynolds, and others in advertising its advantages in home construction and remodeling.

Aluminum siding received a big boost when National Homes, the world's largest manufacturer of prefabricated homes, specified aluminum siding for some models in 1958. On the strength of this, Jim Price, president, was named Modern Metals' Man of the Year for 1958.

Reynolds Metals' House of Ease program, under which close to 30 different aluminum home building products are specified by home builders from coast to coast, played a big role in spurring aluminum siding's acceptance in new construction.

Alcoa in Big

A more recent event of great significance was Alcoa's entry into the siding field. The distinctive Alcoa label on siding cartons and many other aluminum end products has done much to make aluminum siding more acceptable. The effect was compounded by Alcoa's selection of five large building supply manufacturing companies of national reputation to market the siding.

Alcoa's distributors are Barrett Div'n, Allied Chemical Corp.; Bird & Son, Inc.; Flintkote Co.; The Philip Carey Co.; and the Mastic Corp. These names are almost household words, and will make a strong contribution to the siding industry's own plans to increase its stature in the building world.

Mastic's Blair points out that Alcoa sales were outstanding last year. "You'd be flabbergasted if you knew the tonnage Alcoa shipped in only nine months of selling," Blair said. [Modern Metals' estimate of 15 million pounds shipped in 1960 was pronounced "a little too conservative" by Alcoa.]

Roughneck Selling

Not all of the siding industry's public relations are good, however. The nation's newspapers regularly contribute to a sizeable dossier of questionable selling practices by siding dealers. One of the latest to be cited for dishonest practices in the siding field was Town



■ Alside's newest product is a 16-inch wide vertical panel which required special roll forming machines. The Yoder Co., Cleveland, made the special bases for these machines.

& Country Aluminum Corp., Yonkers, N. Y.

Town & Country salesmen reportedly used one of the oldest dodges known to dupe gullible home owners: If the home owner allowed the applicator to re-side the house with aluminum siding for advertising purposes, there would be no charge of any kind. The papers which the homeowner was asked to sign were "mere formalities" which, in reality, obligated the home owner to pay up to \$3600 for the job.

Town & Country Aluminum was ordered dissolved by the New York State Supreme Court early this month.

Kaufman thinks the situation is not as bad as it appears. "As long as there is a great demand for a new product," he said, "it encourages a certain undesirable element to enter the field; most of the time they are dishonest salesmen. I believe they are only a small percentage of the industry."

Alside's chief conceded that in certain instances dealers make a huge profit on a siding job, but it is unusual, he said. "The average dealer doesn't make more than a 5 to 7% profit on a job."

Kaufman sees definite signs that the siding industry is growing up. He called attention to the initiative taken by the Aluminum Siding Association to establish standards and ethical practices for the industry (MM, October, '60). The siding industry around Akron and Can-

Aluminum Siding Consumption (pounds)

	Home Improvement	New Construction	Total
1957	58,000,000		58,000,000
1958	83,000,000	2,000,000	85,000,000
1959	136,000,000	4,000,000	140,000,000
1960*	150,000,000	20,000,000	170,000,000
1961*	160,000,000	35,000,000	195,000,000
1962*	175,000,000	50,000,000	225,000,000

*Figures are estimated

Figures by Kaiser Aluminum Market Research



SOUTHERN EXTRUSIONS, INC.

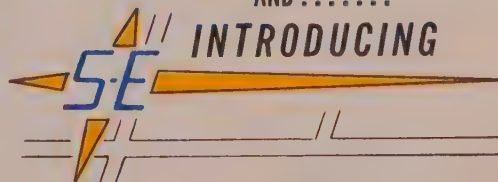
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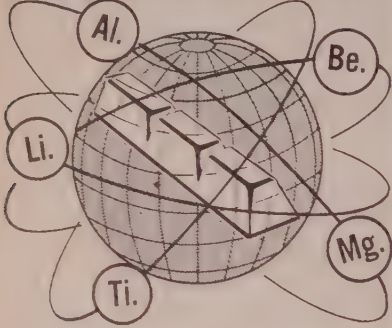
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Read in companies that produce, fabricate and cast aluminum, magnesium and titanium, and firms that use these metals in manufacturing end products.

tion has organized its own association.

"The association has refused membership to a couple of applicators," Kaufman said. "In a local set-up, unethical or dishonest practices can put an applicator out of business without others resorting to legal means."

Apparently an unscrupulous dealer is less vulnerable. If his supplier is unable to keep him honest the law is the only recourse. An alert Better Business Bureau can be highly effective, however.

Salesmen can cut corners and try to deceive prospective buyers, as indicated by a Modern Metals investigation of salesmen's practices in the greater Chicago area. The survey indicated that most salesmen do an honest job of presenting their company's products. Only one was found to trifle with the facts, but this might have been from ineptness rather than dishonesty.

"If 'All's well with the industry' isn't too accurate a description of the siding business, Kaufman believes "Almost all" would fit. "Things are pretty stable; prices are competitive, but with a sound operation, a company can show a profit each year. The outfits that don't have a tight, efficient operation are in for trouble," he warned.

Kaufman pointed out that Alside profits rose 33% in 1960. Prices, he said, go up and down with the cost of raw materials.

Integration? No need for it, these days, says Kaufman. "Plants producing their own sheet today aren't making money," Kaufman said. "There was a time when it sold for 41 cents a pound, but now it's down to 36.3 cents a pound—even less in some areas.

"If the profit potential returns to sheet production, we will start making sheet. We have a completely engineered rolling mill blue-printed for installation when the operation becomes economically sound."

It is highly possible that Alside's neighbor, Alcoa, would not be an integrated facility today if it produced siding alone, instead of aluminum doors and windows, as well.

Alside, on the other hand, may speed up its integration plans as it commences quantity production of its compact pre-fabricated home. But if and when Alside makes its own sheet, it will be by conventional rolling rather than continuous casting.

"Sheet casting is an inexpensive method of making sheet," Kaufman said, "but so far we haven't heard of anybody who is making money with it. Those who have been quoted as casting sheet at, say 4 or 5 cents a pound cannot really be doing it. Your three big independent sheet rollers (Bridgeport Brass, Fairmont and Quaker State) don't use the process; I feel very strongly that



■ In mid-1960 Kaiser Aluminum introduced Twin-Rib, a diamond embossed sheet for roofing and siding for residential, farm and light commercial applications. Primary producers and most independent sheet mills send some design of ribbed or corrugated aluminum paneling to market.

with a conventional slab rolling facility we could beat any strip caster."

It is obvious that even greater gains are ahead for Alside. This year Alside has a sales goal 35% higher than 1960's. Its advertising, with a budget increased 35%, will be seen in *Life* and other mass circulation magazines, including the shelter monthlies.

Kaufman's plans to cultivate the big project builders includes these innovations: Alside will train the builder's people in siding application. "We'll also help him design homes and color style them at no extra charge," he said.

Alside will soon launch its own financing plan for siding buyers. When the Alside house comes into production the plan will be extended to these buyers.

"We're organizing our own credit company with \$43 million," Kaufman revealed. "Alside's growth must be tied in with financing at the consumer level, an absolute must in sound end product marketing. You have to have a 'time payment' plan because, these days, the American consumer buys on credit—even when he has money in the bank."

Kaufman pointed out that, inasmuch as the home owner is installing the siding on the collateral, no down payment is required. Alside's 10-year payment plan beats existing private financing plans by three years.

It's conceivable that a state of near ecstasy will pervade Alside's executive suite as spring comes and a prototype of the "compact house" has its debut on the corporate greensward.

"That house," said Kaufman, "is going to have 23 different aluminum components."

That should keep things humming at Alside's big and growing aluminum building products plant.

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stronger extrusions . . .

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strength, hardness and a tough finish? Choose C872 P Homogenized. **TRIM EXTRUSIONS**—Trim sections needed, with minimum physical property requirements? For desk trim, electrical appliances, similar applications where finish and long die life are of primary concern, select C872 E Homogenized. For more information on extrusion alloys that will help lower your costs and *improve* your product, call your nearest Alcoa sales office. Or write: Aluminum Company of America, 860-A Alcoa Building, Pittsburgh 19, Pa. World-wide sales through Alcoa International, Inc., 230 Park Avenue, New York 17, N. Y.

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ALCOA ALUMINUM

INGOT

"Umbrella" of Aluminum Protects Petrol Patrons in Britain

The unusual canopy below spreads out over a 50-foot diameter and offers shelter to customers of Henley's gas station in Dover, England. This umbrella is another interesting example of the design possibilities of aluminum in structural applications.

THE UNIQUE circular canopy of a new service station in England affords an interesting example of a structural use of aluminum. The canopy looks like an outsized fruit dish, with its cantilevered, concave sides jutting out from the top of the attendant's office.

This swirl of aluminum was designed, fabricated and erected by Aluminium Alloy Fabrications Ltd., of Woking, Surrey, in conjunction with London architect Louis Erdi. The station is owned by Henley's Ltd. of Dover.

The canopy's design takes full advantage of its circular shape. Under uniform loading, the ribs act as arches between an inner compression ring and an outer tension ring. In the event of uneven loading, such as caused by snow build-up on one side and strong winds blowing on the other, the ribs become cantilevers. But the method of construction prevents them from acting inde-

pendently, thereby reducing the stresses.

Outside diameter of the ring-shaped canopy is 50 feet; inside diameter is 22 feet. This area contains the attendant's office which, apart from roof joists being supported on the inner steel ring, is not connected to the canopy. Inner ring is a built-up steel box formed from two tubular steel columns. Outer ring is formed from a mild-steel channel welded at the joints.

52 Aluminum Ribs

There are 52 evenly spaced aluminum ribs placed 1-1/3 feet apart at the inside and 3 feet 1/4-inch apart at the outside. The rib profile is formed from two curves producing an overall depth at the inside edge of 8 1/2 inches, and 4 inches at the outside.

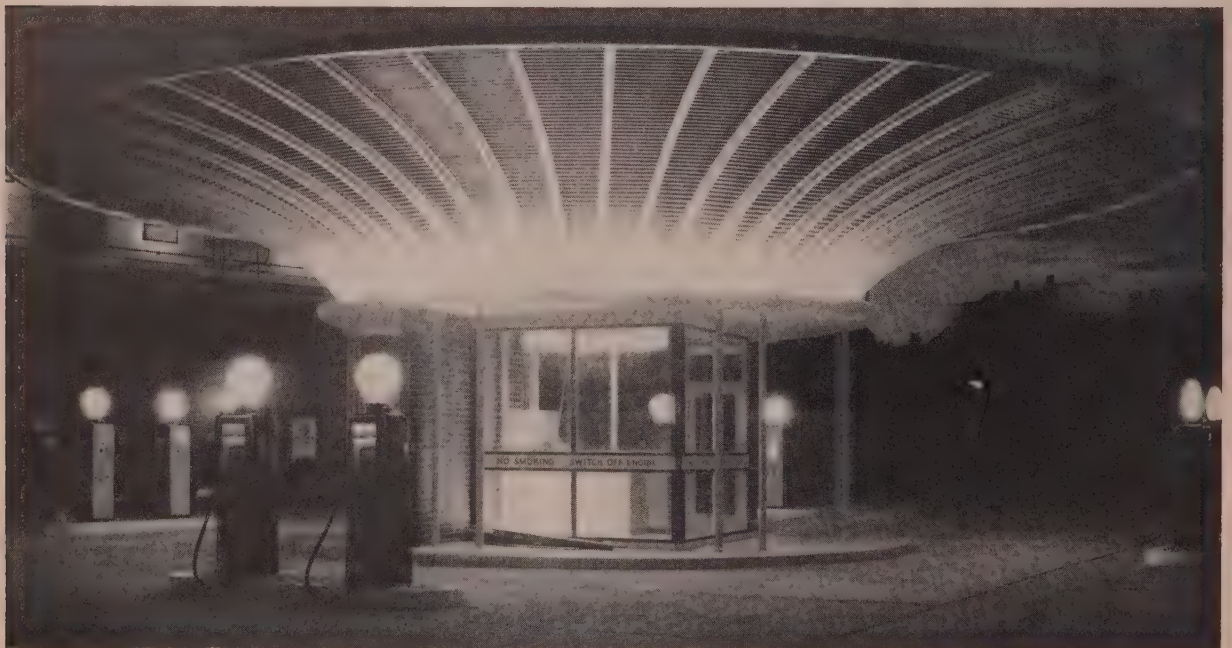
Ribs are built up from two aluminum alloy extrusions supplied by Northern Aluminium Co., Ltd. Sections are curved

and riveted to twin ribs of flat sheet with 3/16-inch diameter pop rivets. Ribs are secured by 3/4-inch thick steel plates riveted to ribs inside the web sheets and welded to the steel rings.

The canopy is roofed with stucco-embossed circular corrugated aluminum sheet which fits between ribs with corrugations running at right angles to them. This not only provides lateral stiffening to the top section, but also supports an outer weathering skin of flat aluminum sheet.

Weathering skin consists of 52 tapered sheets which reach from the outer to the inner ring. The sheets are lapped at the ribs with sealing tape and pop riveted. Roofing felt between the corrugated and flat sheets eliminates chatter.

The office roof protrudes beyond the inner ring and is troughed to hold fluorescent tubes which, together with tubes in the outer ring, give indirect lighting to the pump area.



■ Unusually shaped service station canopy (shown above) at Henley's Ltd., Dover, England makes extensive use of aluminum

alloy extruded sections, flat sheets, and stucco-embossed circular corrugated sheet supplied by Northern Aluminium Co., Ltd.

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Welding Aluminum

Part 9: Weldor Supervision and Safety

The role of the foreman and his relationship to other production department heads is discussed, as well as method and weldor qualification. Also detailed: Safe handling of gas cylinders; clothing; cable selection; and ventilation. Next month — Quality Control.

Based on information supplied by Aluminium Laboratories Limited,
Research Division of Aluminium Limited

PROPERLY trained and supervised weldors working under the safest possible conditions will produce welds of maximum quality at minimum cost. Little more need be said when urging welding shops—both large and small—to follow the recommendations presented here.

In discussing the functions of a supervisory staff, only general principles will be discussed, because many differences of opinion exist concerning details of this staff's operation. Safety, too, will be a discussion of basics, since local codes, too numerous to cover here, must be considered in all shops.

In large organizations where welding is a major fabrication tool, a highly trained staff organizes and supervises all phases of welding. This staff is usually composed of a welding engineer and a number of foremen specially selected and trained for the work.

The welding engineer should have at least five years of practical experience in all aspects of welding. The foremen (also called supervisors or superintendents) are usually specially trained weldors who have shown above average intelligence and initiative.

In small organizations one individual frequently carries out the functions of welding engineer and foreman. He must have special qualifications and abilities if he is to perform his important tasks satisfactorily.

Training a Foreman

As welding evolved from a repair and maintenance tool into a major fabricating process, the role of the welding foreman likewise developed into a position of importance.

Welding ability to a foreman is, of

course, vital. But in addition to this he should increase and know how to apply his knowledge of welding theory and allied subjects such as blueprint reading, metallurgy, heat flow, strength of materials, stresses, electricity, etc.

The effect of high and low welding currents on the mechanical and physical properties of the metal being welded should be thoroughly understood, as should the action and control of simple stresses set up by welding heat. Much of this knowledge may be obtained by private study, assisted by correspondence courses. (For such courses, contact the American Welding Society, 33 W. 39th St., New York 18, N. Y.; or the Canadian Welding Bureau, 1393 Yonge St., Toronto, Ontario, Canada.)

Close Contact Important

The welding foreman should exercise complete on-job control over all welding personnel and welding operations. It is his duty to set up standard procedures with all the information necessary for a weldor to make any required joint. Welding currents and speeds, gas flow, edge preparation, size and feed speed of weld wire should be included.

Ammeter and stop-watch for checking welding currents and speeds should be standard foreman equipment. Flashlight, magnifying glass and fillet gauges should also be at hand for close inspection of welds. Welds should be checked frequently and the foreman should insist that the standard procedures be followed.

Authority of the welding foreman should be the same as that of foremen of allied departments, particularly those in which the work is prepared for welding. This will help ensure that weldors,

for reasons of expediency, aren't forced to weld improperly prepared material.

Edge preparation and joint fit-up largely determine whether or not a weld can be produced to specification. The sequence of assembly and construction is of prime importance in facilitating fit-up and welding. Therefore, the welding foreman should work closely with foremen of allied departments so that correct pre-weld procedures are followed.

He Must Be An Authority

The welding foreman must establish himself as an authority on welding with all departments of management and with other foremen. He should work closely with designers and draftsmen and check and improve, if possible, all weld designs before issue.

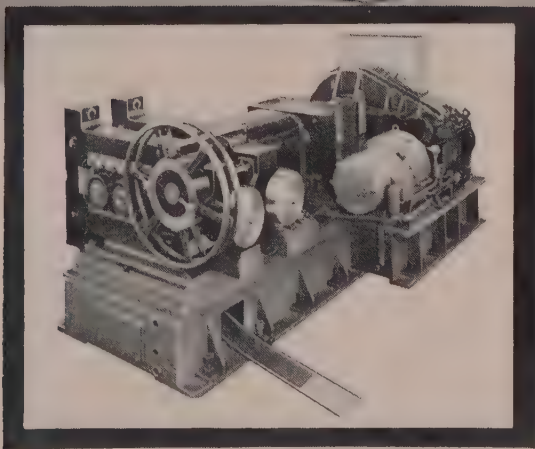
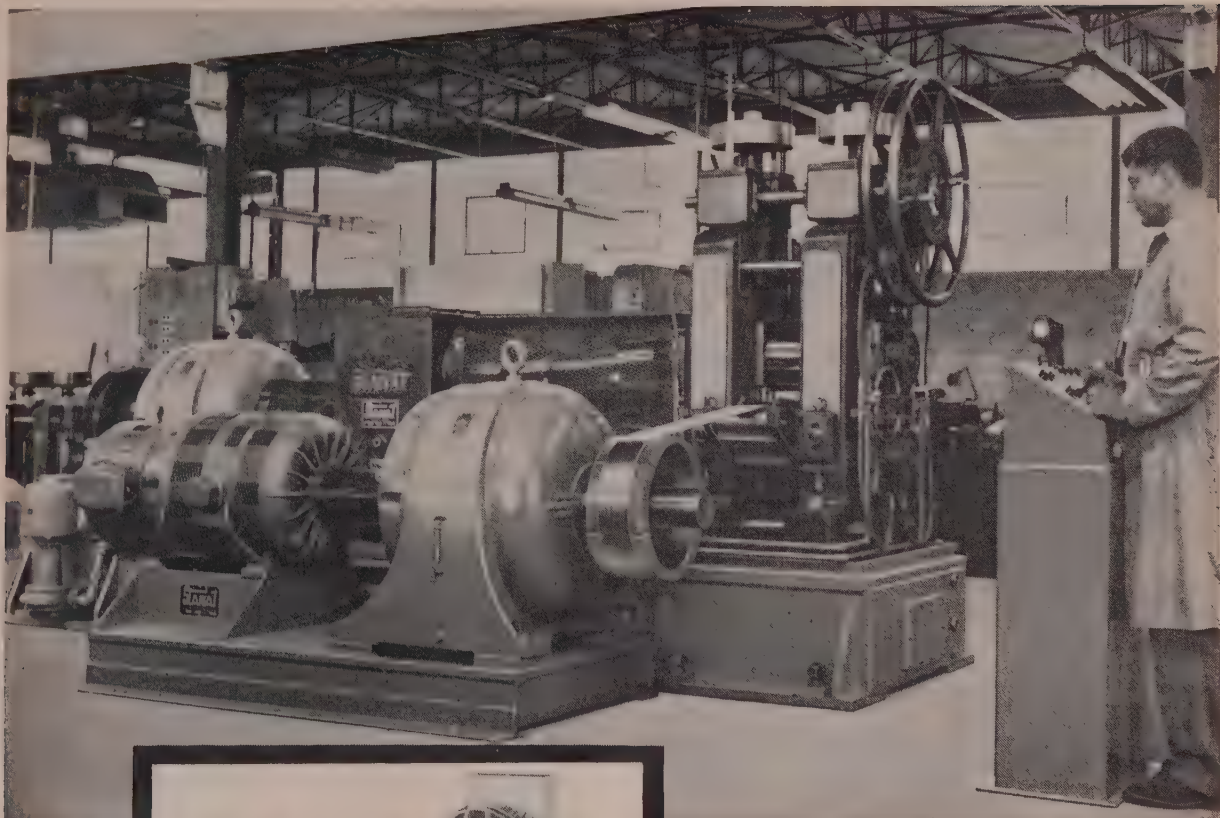
During fabrication and construction, the welding foremen should report all difficulties arising from design to the engineering department so errors are not repeated. Also, he should keep up-to-date on the development of new welding equipment and processes. He should not hesitate to call for technical assistance when he is faced with a difficult problem.

If the proper equipment for any particular job is not available in the shop, the welding foreman must first determine what equipment will produce the best results, and then convince management of the need for it. Management usually relies on the welding foreman to get by with available equipment or justify additional purchases.

Perhaps the most important single factor contributing to good welding is the manner in which the foreman organizes his men and equipment. The

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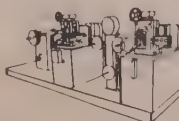
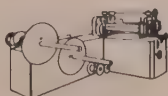
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foreman should have enough trained weldors to make use of all the available welding equipment. These men should be tested and classified periodically to eliminate unsatisfactory welds.

Classification of weldors is very important since it gives the foreman the opportunity of assigning the best weldors to the difficult or demanding jobs.

Allocation of equipment to various places on the job should be planned in advance so that welding may keep up with the balance of construction. Have sub-assemblies welded in the shop because it offers better facilities, working conditions and supervision, and minimum interference from other workmen. In addition, positioning equipment is generally available in the shop so most welds can be made in the flat or optimum position.

Selection of the proper welding process is another duty of the welding foreman. In making this advance decision, he should keep in mind the availability of equipment and the inherent advantages of each welding process.

Watch Edge Preparation

Proper edge preparation is vital; frequently the cause of rejected welds is traced to a fault in this area. The weldor should have authority to refuse to weld a joint which he considers to be improperly prepared. The welding foreman should then judge it and, if necessary, have the material prepared again. It has been found that this authority eliminates controversies and results in better, cheaper welds.

The welding foreman should be familiar with, and keep close check on, all welding equipment including spare parts and welding wire. He should arrange with the electrical department to establish a regular system for checking and servicing all electrical equipment, especially motor-driven generators and welding units. Such a system will prevent costly breakdown and interruptions of welding schedules.

To qualify welding procedures, it is necessary to prove that the welding

conditions outlined will produce sound welds when used by properly equipped competent operators. The following tests are designed to qualify procedures for the TIG (tungsten-inert-gas) and MIG (metal-inert-gas) welding of aluminum. (Official specifications covering procedure qualification for the arc welding of aluminum are not available.)

Test Materials

The alloy, gauge, and temper of the parent material and filler for which qualification is required must be used for the test. Qualification by gauge is usually in increments of $\frac{1}{8}$ inch. The position of welding should be the same as in actual production.

Weld test samples should not be less than $1\frac{1}{2}$ square feet in area. For butt welds they should provide three 8-inch by $1\frac{1}{2}$ -inch specimens for fracture testing, four 8-inch by 1-inch specimens for bend testing, two specimens for face bend, and two for root bend. (Details of all tests will be given next month.)

Procedures are approved and qualified when samples pass either a bend or fracture test (or other tests to be outlined in February.)

If the samples fail to pass the tests, additional samples may be submitted at the discretion of the examiners.

Procurement specifications, particularly those of the armed services, frequently stipulate that welding is to be done only by weldors who have been qualified. Qualification is by tests which prove the ability of the weldor to produce sound welds of various types and in various positions.

Examples of published standards and specifications for the qualification of weldors include: A.W.S. B3.0-41T, "Standard Qualification Procedure" (Tentative); U.S. Mil. Spec. MIL-T-5021A #2, "Tests: Aircraft Welding Operators' Certification."

The tests outlined below are designed to qualify and classify weldors for TIG and MIG welding of aluminum. These aren't official specifications, but the tests are gaining acceptance in indus-

try. (Qualification for the oxy-gas welding of aluminum is required usually only in the aircraft industry, and its specifications should be followed.)

Weldors should be classified according to the welding process used, type of weld needed, and position in which weld must be made. In taking the test, already qualified procedures must be followed and the alloy, gauge and temper of the parent metal and filler for which qualification is required should be used.

For a weldor to be qualified, his samples must pass the same tests required in qualifying procedures. If samples fail, additional tests can be submitted at the discretion of the examining officer.

The following classifications apply to TIG and MIG butt and fillet welds made in the flat, horizontal, vertical and overhead positions.

TIG Process

Class "AT"—Weldors capable of producing all types of joints in the flat, horizontal, vertical and overhead positions.

Class "BT"—Weldors capable of producing all types of joints in the flat and horizontal positions and sound fillet welds in the overhead position.

Class "CT"—Weldors capable of producing all types of joints in the flat position and sound fillet welds in the horizontal position.

MIG Process

Class "AM"—Weldors capable of producing all types of joints in the flat, horizontal, vertical and overhead positions.

Class "BM"—Weldors capable of producing all types of joints in the flat position and sound fillet welds in the horizontal and overhead positions.

Class "CM"—Weldors capable of producing sound fillet welds in the flat and horizontal positions.

Weldor qualification has certain limitations. On work where qualification is required, the weldor should be allowed to use only the process(es) for the types and positions of welds for which he is qualified. Also, he should be re-qualified if he changes employers, or if he does not do welding for which he is qualified for over three-months.

For much of the welding in industry, qualification of weldors is not required, although it is of assistance to both the weldor and his foreman. Qualification tests determine the ability of the weldor, but do not eliminate the need for good supervision, or the inspection and testing of welds.

Safety precautions are necessary in the handling of all welding equipment and during all welding operations to prevent injury to the weldor and others.

(Continued on page 78)

TABLE 1: Safety Codes, Literature

CSA-W117-1952—Code for Safety in Electric and Gas Welding and Cutting

CSA-W55.1-1950—Specification for Resistance Welding Equipment

Canadian Electrical Code—Part I: C22.1-1953—

Essential Requirements and Minimum Standards Governing Electrical Installations for Buildings, Structures and Premises

Canadian Electrical Code—Part II: C22.2 No. 60-1951

Arc Welding Equipment Transformer Type

C22.2 No. 95-1953—Arc Welding Cable

AWS-Z49.1-1950—Safety in Electric and Gas Welding and Cutting Operations

AWS-A6.1-55T—Recommended Safe Practices for Inert Gas Metal Arc Welding

US Fed. Spec. GGG-H-211a Int. Amd. 1—Helmet, Welders and Shield, Welding

BSP1542: 1949—Equipment for Eye and Face Protection During Welding

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At its former location, General Mower Corporation had a \$12,000,000 annual volume. In January, 1960, Gemco moved to Virginia — and in a year or so expects to be doing \$20,000,000 a year.

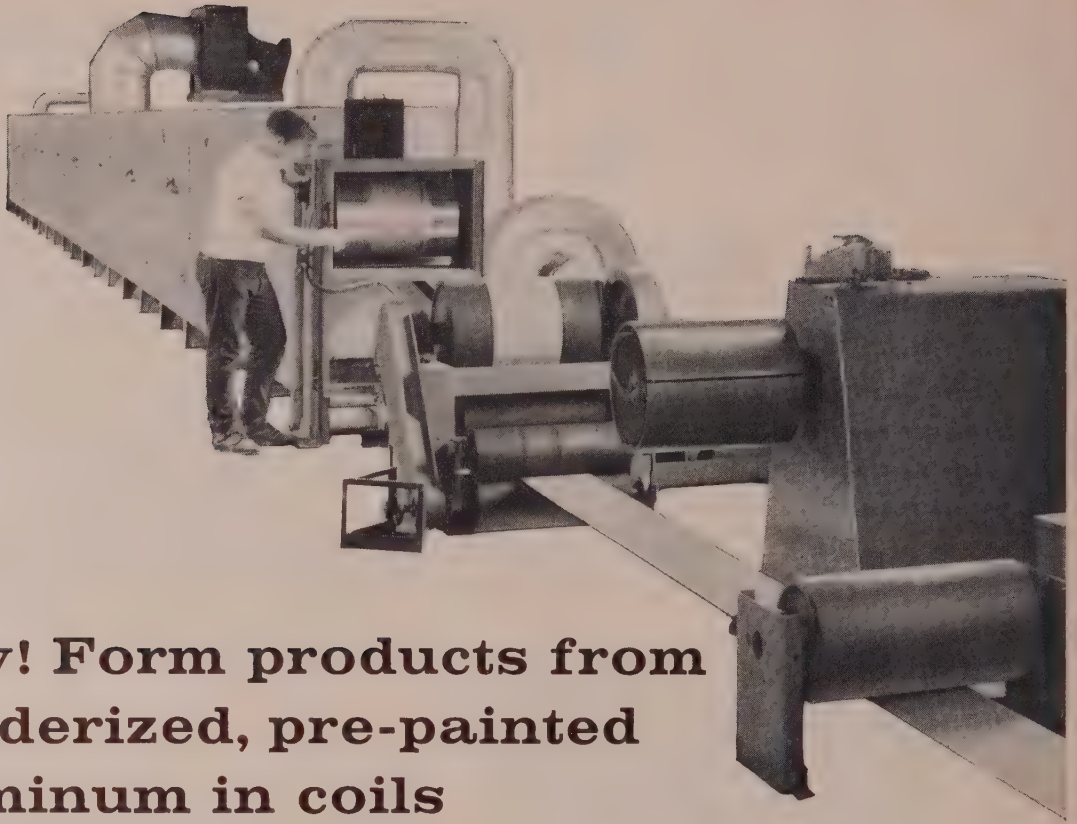
Citing reasons for the company's move, Executive Vice President, Louis H. Faxstein, emphasized, "the ideal location of Norfolk" and "the complete cooperation of business and civic leaders in Virginia." One of the nation's largest manufacturers of power mowers and garden equipment, Gemco also manufactures garden tractors, steel shelving, steel houses and garages, door and window canopies — and is constantly adding new products. The company looks forward to fast-rising volume and sound profits . . . in Virginia.

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- Mobile homes

... a few of many aluminum
products now being made from
Bonderized painted aluminum
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Photo courtesy KEYSTONE ALLOYS COMPANY

Company

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The safety hazards associated with welding are detailed in many books (see Table 1). Obtain copies of these guides so information contained will be available to all welding personnel.

When installing and operating gas welding and brazing equipment special care should be taken in handling cylinders and fluxes. Proper ventilation should be provided and protective clothing should be worn.

Cylinders containing oxygen and fuel gas should be stored and handled in accordance with local municipal and other regulations. They should be kept away from radiators and other sources of heat and stored in a well protected, well ventilated, dry location. All cylinders should be protected against excessive rise in temperature.

When cylinders are moved by crane or derrick, a cradle or supporting platform should be used to make sure that the cylinders do not drop. Slings or electric magnets should not be used for this purpose. Valve protection caps should always be in place when cylinders are being moved and cylinders should not be transported by means of this cap.

A suitable mounting device to which cylinders can be attached rigidly should be employed when the cylinders are in use. Cylinders should not be placed where they might become part of an electrical circuit. Oxygen, acetylene or other compressed gases should not be used as substitutes for compressed air (e.g. to operate pneumatic tools or to blow dust, etc. from clothing).

Oxygen cylinders, cylinder valves, couplings, regulators, hose and torch apparatus should be kept free from grease or oil, since these substances may cause an explosion. Never handle oxygen cylinders or apparatus with oily hands or gloves and never store the cylinders near oil or where oil or grease may drop on them.

Compressed gas cylinders should only be opened with the tools supplied for the purpose. If the valves cannot be opened by hand, notify the supplier.

Pressure reducing regulators and hose

**TABLE 2: Cable Sizes
For Arc-Welders**

WELDING CURRENT (AMPERES)	CABLE SIZE NO.
100	4
150	3
200	2
300	1/0
400	2/0
500	3/0
600	4/0

CSA, Spec. W117-1952

Aluminum welding cables are easily obtained and are preferred on some applications. The size of aluminum cable should be in accordance with the supplier's recommendations, usually one size larger than copper cable. With the MIG process, minimum cable size may be governed by voltage drop rather than temperature rise.

to connect torches to gas outlets or cylinders must meet area regulations.

The fluxes used for oxy-gas welding and brazing should be handled with care and not allowed to come in contact with the operator's hands, face or eyes. Suitable washing and first aid facilities should be close to the welding area so that in case of an accident, any flux may be removed from the operator's skin immediately.

Adequate ventilation should be provided in the welding area to remove excess heat and the fumes created by welding. The fumes arising from aluminum welding and brazing, while relatively innocuous, still require removal by ventilation.

Special lenses should be used in the operator's goggles when welding and brazing aluminum since they allow good visibility of the joint. These special lenses are different from those used in welding and brazing steel. Cobalt blue lenses are not as satisfactory, but may be used if special lenses are not available.

The weldors should wear gloves and other protective clothing to protect themselves from the heat of the flame and accidental contact with the fluxing mixture. Protective clothing should be dark and heavyweight.

Codes covering the installation and

operation of arc welding and cutting equipment were written primarily to cover the metal arc welding of steel, but many of the recommendations contained therein apply to the MIG, TIG and metal arc welding of aluminum.

Because of the high current densities used when welding aluminum with inert arc processes, rigid safety precautions are necessary. The high level of radiation from the inert gas arc makes it necessary to take special care in protecting the eyes and skin by means of adequate filters and heavy clothing. Consider, also, others working adjacent to the welding operation.

All welding personnel should be properly instructed in the operation of electric welding equipment to minimize the possibility of an operator receiving an electrical shock.

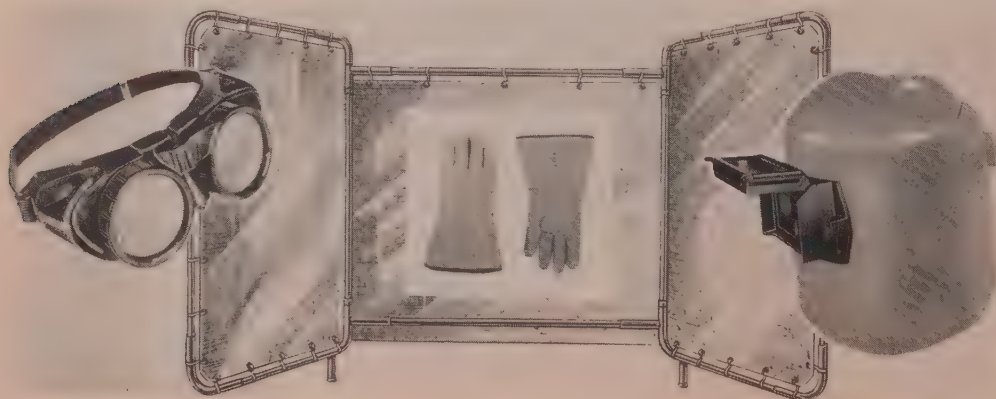
All electrical connections should be checked thoroughly before welding is started. All insulation on torches, electrode holders and cables should be in good condition. Frayed, worn or otherwise damaged welding cables should be repaired or replaced.

If the required cable size is not available (see Table 2), two cables of the next smaller size may be connected in parallel. When using constant potential characteristic power sources, it may be necessary to use much larger cable sizes than indicated in Table 2 to avoid a voltage drop in the leads.

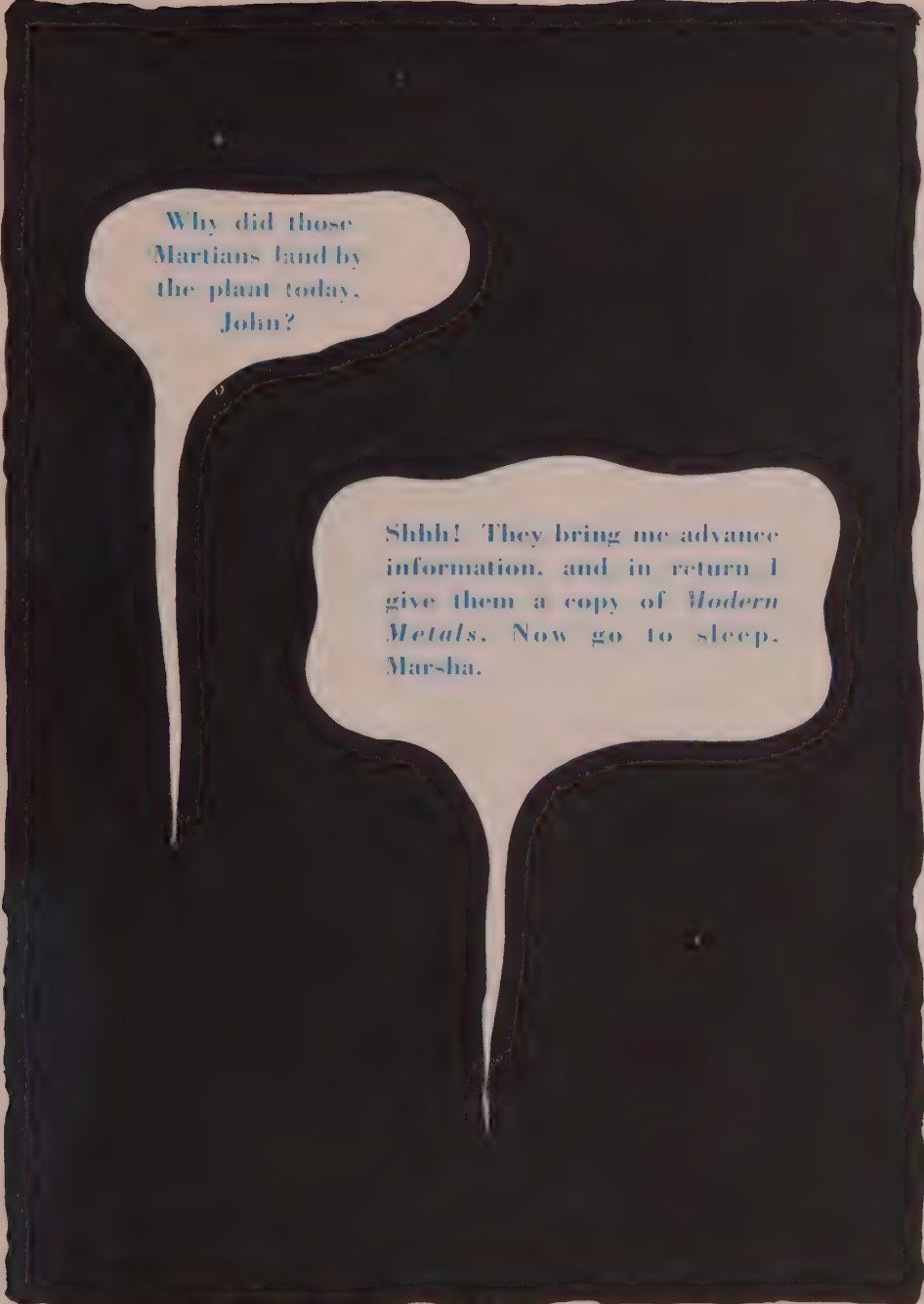
Welding cables should be protected from mechanical damage by being suspended from overhead or by being bridged if they have to remain on the ground. Where several welding cables have to be joined together, the joint should be made by means of proper connectors which should be insulated after the joint has been made.

Welding ground returns should connect the workpiece to the ground terminal of the power source. Pipe lines, building structures, etc., should not be used as part of the ground circuit.

Use helmets and hand shields when arc welding or cutting to protect face and eyes from direct arc radiation. Helmets and shields should be made of



■ Here is what weldor needs for work. Goggles and helmet (Sellstrom Mfg. Co., Palatine, Ill.) protect face and eyes. If arc welding in confined, reflective area, canvas flap should be attached to back of helmet to cover weldor's neck. Gauntlet gloves (Wheeler Inc., Chicago) protect hands; screen (Singer Glove Mfg. Co., Chicago) protects persons outside weld area.



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materials that do not conduct heat or electricity, that are not readily flammable, and that can withstand sterilization. The back of the neck and ears should be protected from reflected rays, such as encountered when welding inside a tank, by a canvas flap attached to the back of the welding helmet.

Three shades of lens are available for arc welding aluminum: Shade No. 10 for welding currents from 75 to 200 amperes; shade No. 12 for welding currents from 200 to 400 amperes; and shade No. 14 for welding currents over 400 amperes.

Generally, a No. 12 lens provides sufficient protection for most welding

operations since it reduces the ultra-violet and infra-red radiation to a very low level. (U.S. Federal Specification GGG-H-211a INT.AMD.1 (Ships) gives valuable information on the selection of welding lenses and other components.)

Lenses in the welding helmet should be as large as possible. Lenses measuring 4 by 5 inches have been found very satisfactory and they do not increase the helmet weight significantly.

Protective colored goggles should be worn by the weldors and other personnel in the welding area. They should be tinted green to protect the wearer from reflected radiation but should be

sufficiently transparent to give good visibility at all times. Their use is especially recommended when several weldors are working in the same area and in confined spaces.

Arc reflection can be minimized by painting the welding area a color having low reflectivity (non-glossy) or by the use of portable drapes or shields. Signs should be placed near the welding site to warn people in the vicinity not to look directly at the welding arc.

Protect Skin From Arc

Exposure of skin to the rays of a welding arc for even a short time can cause burning similar to sunburn. Therefore, it is important for the weldor to make sure that his face, scalp, neck, chest, arms, etc., are protected from arc radiation by heavy, dark clothing and a helmet.

Light colored clothing should not be used since it absorbs only a small percentage of the ultra-violet rays and may reflect these rays up under the weldors' helmet or shield. Soft leather gauntlet type gloves should be worn by the weldor. The gloves should be stitched with a material which will not disintegrate upon exposure to the rays of the arc.

While very little spatter is encountered when welding aluminum by the MIG or TIG process, nevertheless, the weldor's clothing should be designed to prevent molten metal from lodging in it. Sleeves and collars should be kept buttoned and pockets should be eliminated from the front of clothing. Trousers or overalls should not be turned up on the outside.

In metal arc welding of aluminum with flux-coated electrodes some spatter may be encountered. In such cases, a leather apron should be worn in addition to the protective clothing mentioned above.

Ventilation

Adequate ventilation should be provided in the weld area to remove excessive heat, smoke and fumes. When aluminum is MIG or TIG welded, little smoke is generated. However, ozone is produced under certain welding conditions and it should be removed since sufficient concentrations are poisonous. When welding in tanks or other confined spaces, use auxiliary exhaust systems.

Trichlorethylene and carbon tetrachloride and their fumes should be kept from the welding area since the arc breaks these solvents down to form a very toxic gas. Material that has been degreased by these two chemicals should be allowed to stand in a well ventilated area, well removed from welding arcs for 6 to 8 hours prior to welding.

HOW TO WELD ALUMINUM

This series of reports on welding aluminum will be reprinted.

This manual will cover the following topics:

WELDING PROCESSES—Characteristics and relative merits of 10 methods are outlined.

TIG WELDING—equipment needed; selection of gas, filler alloy; torch manipulation; adjusting current; etc.

MIG WELDING—applications; equipment; filler alloy; adjusting arc; torch manipulation; trouble shooting.

MIG vs. TIG—relative cost, versatility, weld quality, etc. of these two main aluminum welding processes.

RESISTANCE WELDING—types of machines, electrodes, cleaning methods, etc. for spot, seam, flash welding.

OXY-GAS & METAL ARC METHODS—how to choose flux, filler etc.; jiggling; flame control; current control, etc.

BRAZING—when and how to use torch, dip and furnace brazing on aluminum.

PRE- AND POST-WELD OPERATIONS—full details on joint design; cleaning, etc.

SUPERVISION AND SAFETY—how to train and supervise your welding personnel (see article, page 72, this issue).

QUALITY CONTROL—how to obtain optimum weld quality.

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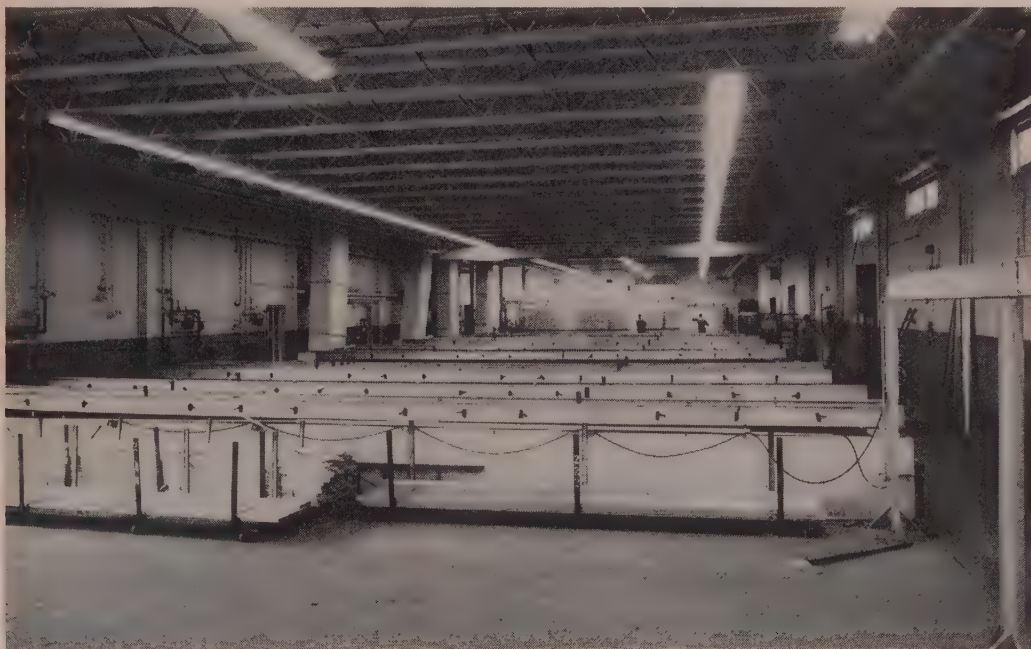
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FINISHING AND FORMING ALUMINUM SIDING AT



In its high speed, highly automated aluminum siding operation, Wallmaster Division cleans, conversion coats, paints coiled aluminum stock, then slits and roll forms at speeds of 100-130 fpm. Forming after shearing avoids distortion.

HIGH SPEED continuous finishing and forming of coiled aluminum strip is the key to economical production of residential siding at the South Kearny, N.J., plant of Brixite Manufacturing Company's Wallmaster Division.

Of the various methods available for the production of siding, Wallmaster elected to pre-finish the coiled aluminum strip, then form siding panels from the pre-coated stock. This approach, the company reasoned, would cut finishing costs considerably without sacrificing the quality of the final product. It was decided that the finish-then-form cycle would eliminate much of the costly handling associated with painting of cut-to-length pieces.

But to make the operation both practical and economical, Wallmaster had to install the most up-to-date roll coating and roll forming equipment, and employ top quality metal treatment and finishing materials. The installation that is now achieving the desired results was developed under the direction of Al Chalmers, chief engineer of Wallmaster Division.

The pre-finishing line, designed and built for Wallmaster by Gasway Corp., Chicago, takes in 10½-inch wide coiled

aluminum sheet at one end and delivers gleaming coils of vinyl coated siding stock at the other. The uninterrupted sequence of operations includes uncoiling, washing, rinsing, conversion coating, roll-coating, baking and re-coiling of the aluminum sheet.

No Line Stoppage

At the head of the line are two tandem mounted unwind reels, which permit strip to be continuously finished with no line stoppage between coils. A coil of sheet is placed on one of the reels and started through the pre-finishing line. Shortly before this coil is exhausted, another coil is positioned on the second reel.

As the first coil comes to the end, a brake is applied on an accumulator, through which the strip passes before

entering the treatment tanks. The accumulator consists of a tall frame with stationary rolls mounted at the top and a powered elevator carriage at the bottom. This device accumulates a substantial footage of strip which, when the brake is applied, continues to feed into the line at 130 feet per minute.

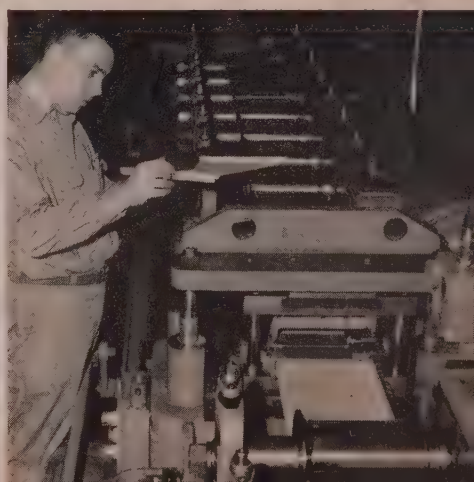
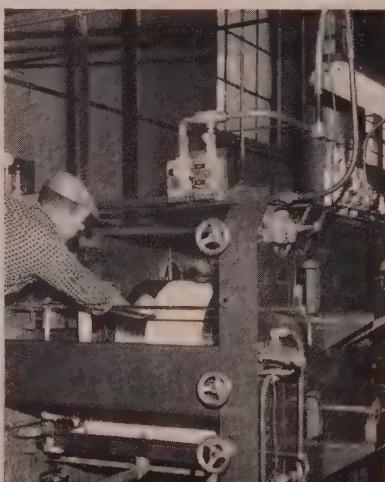
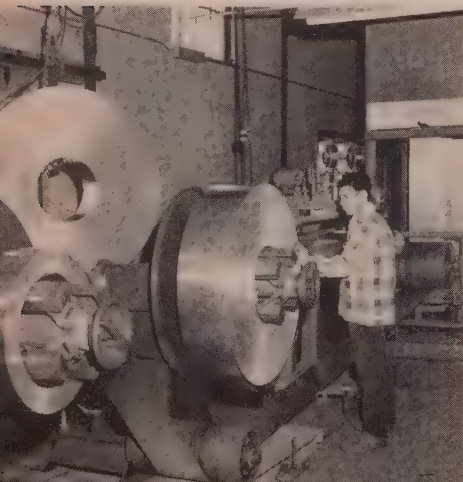
While the accumulator is thus feeding the line, the front end of the new coil is stitched onto the tail end of the old coil.

When this stitching is done, the brake is released and the powered elevator carriage (which, by this time, has risen to the top of the accumulator) descends and starts storing enough strip for the next changeover of coils. By maintaining this continuity of finishing, a minimum of strip is discarded (only a small section adjacent to the joining of the two coils).

Upon leaving the accumulator, the strip passes through a five-stage cleaning and conversion coating process. The first stage is a 35-foot chamber in which an alkali bath is power-sprayed on the strip, chemically cleaning and degreasing it.

Following a rinse, the strip passes through the Bonderite bath, in which a chromate skin is formed on the sur-

Operations at Wallmaster (below) include: At left, 2000-pound coils of aluminum are unwound, stitched together, then automatically conveyed through treating, coating, baking cycles of Gasway cleaning and coating line. Center, operator checks wet film thickness on strip at roll coater. Right, operator checks flatness and angle at intermediate cut-off of roll former.



face of the aluminum. This enhances the corrosion resistance of the metal and provides a good mechanical bond for the enamel. Two rinses follow—first cold water, then a final acidulating rinse to “set” the chemical coat applied in stage 3.

Drag-out of chemicals from one stage to the next, a process that would tend to shorten the life of the ultimate enamel coating and increase the cost of chemicals, is prevented by Gasway's special squeegee assemblies at the end of each stage which force the excess fluid back into its own chamber.

Reverse Coat With Vinyl

Before entering the coating stage, the strip is cooled and dried in a tower. The coater, which applies Sherwin-Williams vinyl enamel to both sides of the strip in one pass, operates on the reverse coating principle. The coating rolls turn in the direction opposite to the travel of the strip, thus, coating the strip with a smooth film, free of any flow-out marks or other flaws. The coater is supplied with enamel by a precision fountain which insures tight control of thickness and color.

From the coating stage, the strip enters gas-fired ovens in which it is suspended by tension over a 100-foot travel. Temperatures from 250° to 500°F dry and bake the finish. When the strip emerges from the oven, it passes through a water spray which cools it sufficiently to allow it to pass through the powered pull-through unit.

The now pre-finished strip is finally rewound onto independently powered tandem rewind units. A back accumulator and brake (just before rewind) allows time for the shearing of the continuous strip when one rewind reel becomes filled. The new strip end is then fed onto the other rewind reel to begin formation of a new coil.

This completes the finishing phase of siding manufacture at Wallmaster.

Avoid Shear Distortion

From the coating operation, the 1500-pound coils of pre-finished stock go to the slitting and forming department. Here a heavy duty, multi-stage machine completes the manufacturing process, roll forming siding at speeds of 100-130 fpm.

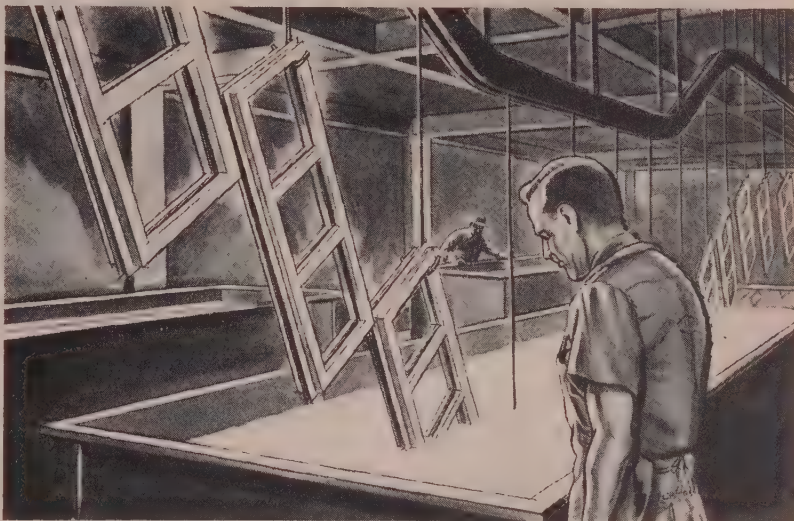
About midway through this machine, the stock is sheared. The sheared length then passes through several forming stages in which the usual problem of distortion due to shearing is eliminated.

Normally, sheared ends on siding have enough distortion to cause difficulty in shipping and installing. At Wallmaster, however, this problem is neatly avoided by shearing before final forming.

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ALUMINUM SCORES GAINS IN CAN MARKET

... but the large scale shift to aluminum by citrus juice packers last year was achieved with costly research and promotion, plus rock-bottom sheet prices. Producers aim to boost share of market for oil, fish, meat, beer cans.

by K. B. Rhodie, Associate Editor

SPAKED by technological gains, super-salesmanship, and rock-bottom prices, aluminum last year edged a few steps further into the food can business, a tonnage market long dominated by tinplate.

The year's most notable triumph came when seven packers of citrus juice concentrates announced that the bulk of their 1960-61 crop would go to market in aluminum cans. An estimated 1.6 billion 6-ounce cans will be needed, and the aluminum producers expect to supply sheet for 600 to 800 million units.

With the little containers weighing about one-half ounce each, it should amount to a demand for 8500 to 12,500 tons of aluminum sheet. Next year, the aluminum producers count on capturing 90% of the citrus concentrate can business, boosting aluminum consumption to about 22,500 tons.

A major step in obtaining volume orders for aluminum citrus cans was

taken last spring when Reynolds Metals Co. drove a mass production can line, complete with pre-cut aluminum can parts, from its Bellwood, Va., facilities to the Auburndale, Fla., plant of Minute Maid Corp. Reynolds' objective: to show canners how to assemble their own cans—made of aluminum, of course.

On May 2, the unit was hooked to Minute Maid's packing lanes to make a single line which formed, filled and closed cans, then froze the juice and packed cans for shipping. In less than three weeks 6.5 million cans of juice were on their way to four test markets.

On August 1, with preliminary test results in, Minute Maid disclosed that "beginning with the 1960-61 packing season, nearly all of the standard 6-ounce containers to be used at the Auburndale concentrates plant—an estimated 50-million—will be aluminum."

This marked the first full-scale use of aluminum cans in the citrus industry,

and the first time a citrus packer planned to assemble its own containers. The machinery, made by Baldwin-Lima-Hamilton Corp., Philadelphia, and modified for aluminum by Reynolds' engineers, was installed at Auburndale last fall. Citrus concentrates are now flowing into 450 aluminum cans a minute.

On December 1, five more Florida firms adopted aluminum cans as the standard 6-ounce containers for their juice concentrates. These firms pack 12 brands which will need a minimum of 110 million units, and numerous private labels calling for 265 million cans.

Using these 375 million containers will be Pasco Packing Co.; Winter Garden Citrus Products Cooperative; Plymouth Citrus Products Cooperative; Hi-Acres Inc.; and Southern Fruit Distributors Inc.

The seventh firm, a food buying association of independent supermarket chains called Topco Associates of Chicago, announced December 13 that all of its concentrate this season will go into "tens of millions" of aluminum cans.

Formed cans will be purchased from American Can Co., Continental Can Co., Inc., and Crown Cork and Seal Co.

Slow production of aluminum cans has been a big problem. Average tin can fabricating speed is 550 a minute. Reynolds has come closest so far with its modified equipment, but the 450-can rate still trails tinplate.

Kaiser Aluminum, working jointly with E. W. Bliss Co., Canton, Ohio, and Central States Can Co., Massillon, Ohio, developed a can line which normally produces 200 to 240 cans a minute, but can be souped up to turn out 400 (see MM, Nov. '60, p. 38).

This seems to be a pretty good speed, and the new line has other advantages. Seamless cans—the squat type used for tuna fish, etc.—are deep drawn from a coil of pre-lacquered sheet. This also quickens the operation while cutting coating costs. The line, consisting of a blanking and draw press, a redraw press and a trimmer and flanger, is now making cans for a packer of potted meat.

Alcoa is trying to apply ultrasonic welding to aluminum can production. F. J. Close, Alcoa's vice president of



■ Formed cans come pouring out of production line at Auburndale, Fla., plant of Minute Maid Corp. From bin, cans go directly into regular juicing lines where concentrate will be injected, cans closed, juice frozen and cans finally packed for shipping. Inset shows aluminum can components supplied to Minute Maid; includes a printed flat shell and ends (partially shown).

sales, says that this method could ultimately turn out 800 to 900 cans a minute, with side seams that retain 95% of parent metal strength. But refinement of the method seems a long way off.

Energetic and relentless sales efforts have typified the aluminum industry, and such was never more evident once aluminum took out after steel's can market. Packers have been tirelessly sold on lower shipping costs (citrus packers will save about \$1 per 1000 cans by using aluminum).

End of Can Openers?

Creative selling, based on real technological gains, has been aimed at both packer and consumer. Prime examples: Reynolds driving a portable can maker into a Minute Maid plant to show firsthand how lightweight containers can be assembled by the packer; Alcoa and Kaiser developing tear-top cans that eliminate use of household gadgets that need washing and break fingernails.

Alcoa was first to introduce this innovation—on a foil laminated paper can that was market tested in Providence, R. I. Pull the tab attached to this aluminum lid, and a thin scored strip of metal is torn out, taking the top with it (see MM, Sept. '60, p. 95).

Preliminary results show that the market test was "extremely successful," according to Alcoa. Its early prediction is that variations of such lids will some day cap every can made—aluminum or tinplate—creating a need for 250,000 tons of aluminum.

The other easy-open can top appears to be further along than Alcoa's; is used on the drawn cans developed by Kaiser, Central States and Bliss. This lid is crimped to the top of the flanged can and a tab is placed at the side.

A jerk on the tab pulls a strip of aluminum away from the seam joining top to body. The freed lid is then lifted out. Because of its countersunk shape, it can be replaced when storing contents. The packer of potted meat is using this lid.

These tops can be used with aluminum or with tinplate cans; would be an excellent addition to soft drink containers sold in vending machines. Once the lid is removed a smooth edge is left so the container can be used as a cup.

Early last year, F. B. Newcomb, vice president of the Canco Div'n of American Can Co., commented that, "The key to whether or not aluminum will eventually be used for the large volume processed items will depend to a large degree on the future price actions of the aluminum producers."

Competitive pricing was nothing new to the aluminum industry. It coveted the high volume of the citrus canners

and wooed them with .008 gauge degreased sheet at 32.5 cents a pound, a little less than tinplate.

Last summer, many aluminum products were hit with price hikes, but can sheet held steady. Then in August, when the primes smelled a victory, Kaiser led the way to the current 32.2 cent price tag.

About this time, U. S. Steel introduced Ferrolite, its new "thin tin," priced from \$2.45 to \$3 under regular tinplate and weighing 25% less.

It's still too early to analyze what Ferrolite's total effect will be, but it did not stave off the citrus-packer rush to aluminum.

Last year also brought forth the unexpected—aluminum cans selling for less than tinplate. Reynolds' encouragement of Minute Maid to assemble its own cans forced can makers to cut the price of aluminum units by \$2 per thousand to prevent more packers from thinking along the same lines.

But sheet cost is still the important price. Current consensus is that the primary producers took a beating while gaining citrus contracts. But Cliff Sands, Alcoa's rigid container manager, looks for present prices to bring more profits in the future because of pared mill costs.

"We expect that with technical im-

provements our prices will be sound in the long run," Sands explained. "Some necessary changes have already been made in this direction. Others will have to wait on increased volume."

For Oil, Fish, Meat, Beer

Last year was marked with some success for aluminum, but what of 1961? According to primary producer prophets, it will bring more successes. Currently, about 30% of the one-quart oil cans produced are aluminum, and gains seem imminent. Anywhere from 25% to 50% of this season's citrus pack will be in aluminum—and a leap to 90% is expected for the '61 season.

Inroads are expected in the West Coast tuna packing industry. Potted meats are another good bet for aluminum, and recent reports predict numerous breweries switching to aluminum shortly.

Aluminum cans represented from 1% to 2% of the total cans used in 1959; about 5% in 1960. Goal for 1961 is 10%; for next decade anywhere from 20% to 50%.

What will the steel people be doing while aluminum is striving for these heights? Right now they're digging in to see to it that aluminum is not used in more than 5% of total cans made in 1961—or any other year.



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85-Foot Experimental Railroad Car Passes Freight Test

The largest aluminum railroad car, 85 feet long overall, has been successfully freight-tested in a coast-to-coast run, according to Harvey Aluminum, Torrance, Calif., who developed the experimental unit in cooperation with the Rock Island Lines and North American Car Corp.

Designed to provide protective shipment for long loads, the covered gondola car has an 8-ton payload increase over steel equipment.

"This prototype car, under lease to the Rock Island from North American, demonstrates the application of large structural aluminum extrusions to achieve fabricating economy, improved performance, and lower cost per ton of capacity," explains L. A. Harvey, chair-

man of the board of Harvey Aluminum.

Dramatic feature of the all aluminum body is six huge aluminum extrusions, 82 feet long by 25 inches wide. Three of these channel sections are stacked longitudinally and joined mechanically to form each side. For the roof, panel-type aluminum extrusions were fabricated into four 20-foot sections, easily removable for freight handling.

The completed car weighs 75,900 pounds. A comparable steel car would weigh eight tons more. The weight of the aluminum superstructure is under 10,000 pounds. Load limit is 134,100 pounds; capacity is 3240 cubic feet. Contract production of the aluminum gondola car is being discussed.



Quick Remodeling Job Utilizes Aluminum Panels

The remodeling advantages of aluminum siding are clearly pointed out in the above pictures showing the 70-year-old Romanoff Electric Motors Co. building in Toledo, Ohio, before and after a major face-lifting.

It took six men two weeks to apply the 122 panels needed to cover the warehouse and office building. Panels, supplied by Crown Aluminum Industries Inc., Pittsburgh, are 12 feet long with an exposed width of 9½ inches. The desert tan color is baked enamel.

Siding contractor Stone and Swartz-

baugh, Toledo, first attached a wooden 2 by 4 framework to the brick building using 2½-inch concrete nails. Siding was then hammered in place using aluminum nails.

The building's interior was also renovated with new floor slabs, offices and aluminum windows. Stan Tahl, Inc., Toledo, handled the inside work; architect Herman Feldstein designed the complete remodeling job.

Remodeling of existing structures will play an increasing role for aluminum in the building field.

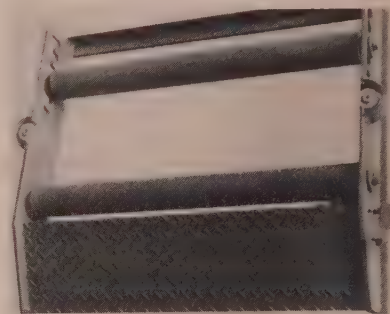
Titanium Pressure Vessels Used In Three Missiles

Three major missile systems—Atlas, Titan, and Polaris—have switched from heavier alloy steels to titanium pressure vessels. The change in materials has produced contracts in excess of \$3 million for the Airite Division of The Electrada Corp., Los Angeles.

Pressure vessels are used to store propellants and inert gasses under extremely high pressure. These gasses are released during flight for engine fuel feed, airframe pressurization or control functions. Pressure vessels also have application in ground support equipment and other systems in which gases or liquids under pressure perform useful functions.

At the inception of these missile programs, stainless steel vessels were used. Difficulties in forging, machining and welding the metal were its drawback though titanium is 40% lighter.

Airite began to experiment with titanium alloys in 1958 and qualified its first titanium vessels for the Atlas program in 1959. Airite also developed a proprietary welding process which assures consistently sound welds at working pressure of 10,000 psi, under extreme conditions of temperature vibration and G-loads.

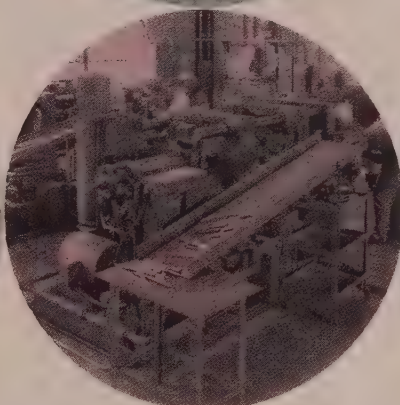


Magnesium Dolly Handles 2000-Pound Cable Reels

A dolly for handling wire or cable reels weighing up to 2000 pounds is made of welded magnesium by Magnesium Co. of America, 155 S.E. 10th Ave., Hialeah, Fla. The entire unit (above) weighs only 33 pounds.

The dolly can be used either inside buildings or on open ground. The tread of the approach apron provides safe and easy mounting of reels on rollers; ratchet settings permit adjustment of the rollers for all size reels; footlock is simple to operate.

Nylon ball bearing rollers on each side frame, recessed and under protective shields, permit the reels to revolve freely. The rollers allow up to 30 inches of usable width, and will accommodate most reels. For handling larger reels two dollies set side-by-side can be used.



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Dow Buys Sheet Aluminum; Drops Casting Operations

The only Michigan plant with a mill rolling aluminum sheet—Sheet Aluminum Corp., Jackson—has been purchased by the Dow Metals Products Co., Midland. The details of the sale were to have been worked out by the end of January.

Sheet Aluminum is a wholly-owned subsidiary of Mueller Brass Co., Port Huron, Mich. Several months ago Mueller granted Dow a six-month option to buy the firm's land, building and equipment.

Subsequent to the purchase, Dow announced that the Wellman Bronze & Aluminum Co., Cleveland, had leased Dow's sand and permanent mold foundry in Bay City, Mich. The plant produces magnesium and aluminum castings.

This followed Dow's December announcement that its Bay City die casting department was being closed. Reason for both moves, explained the firm, was to remove Dow from competition with other foundries who are its customers for magnesium ingot.

No changes in personnel at the Jackson for both moves, explained the firm, to a Dow spokesman. The plant, which has been in operation since 1925, produces aluminum coil and flat sheet and such commodity items as residential siding sheet, building sheet, and stock for lamp bases, heating fins, and weatherstripping.

Its equipment includes a 4-high rolling mill, annealing furnaces, slitting and shearing lines, sheet stretcher and roller leveler.



Ten-Foot Wide Boxcar Doors Fabricated of Aluminum

All-aluminum structures 10 feet wide are claimed by Youngstown Steel Door Co., Youngstown, Ohio, to be the largest single boxcar doors ever made.

Four hundred of the giant doors have been shipped to Pullman-Standard's Bessemer, Ala., shops for installation on new boxcars.

Youngstown produced the doors, first such large scale use of aluminum, with existing equipment. Since costly retooling is eliminated, the company forecasts increased use of aluminum for this application.

Since the 10-footers weigh less than half as much as comparable steel doors, they can easily be opened or shut by one man. Because of aluminum's light weight, the doors could be made larger than standard size, permitting more efficient car loading and unloading.

Adrian Extrusion Plant On the Block Again

The history of the government-built air force extrusion and forging plant at Adrian, Mich. has been one of many managements and heavy losses ever since the end of World War II. The 800,000 square foot plant, erected at a cost of \$20 to \$30 million, was originally operated by Bohn Aluminum. In the late '40's, Reynolds Metals took it over, then Bohn took it back again during the Korean War period.

In recent years the plant has been operated by Bridgeport Brass. Late last year Bridgeport pulled out, and the facility went back into the hands of the GSA. Then it was put on the block several months ago, and the highest bidder was Strom Machinery, which offered \$3,050,000. Harvey Aluminum bid \$2,256,000, and a third bidder offered \$1,825,000.

Strom had planned to dismantle the plant and subdivide it for use by sev-



Litho-Strip Corp.
(Job Coating)



Stanley Judd Division
(Drapery Hardware)



Keystone Alloys Co.
(Siding)



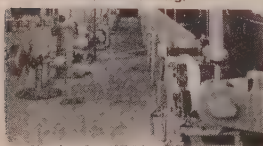
Reynolds Aluminum Supply Co.
(Job Coating)



Trane Company
(Baseboard Heating)



Comaco, Inc.
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Koolvent of Canada
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Crown Mfg. Co.
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eral firms. Harvey intended to use it for fabricating aluminum, titanium and zirconium—a proposal that met with local enthusiasm because they saw a chance for re-employing the 800 or so people who worked there for Bridgeport.

The Aluminum Extruders Council, on the other hand, claimed that there was already a surplus of aluminum extrusion capacity in the midwest; that the plant would take work away from the independent extruders; and that primary metal from Harvey's potlines would allow Harvey to sell extrusions at a lower price than the independent extruders.

The extruders claimed that it would accomplish nothing in relieving unemployment in Michigan, and stated that the 30 independent extruders in the midwest operate 125 presses, most of which are running at half or less of capacity.

Harvey's president, Leo Harvey, replied that the Council was opposed to progress and wished to stifle competition; that reactivation of the plant by his company would help generate new uses for aluminum extrusions.

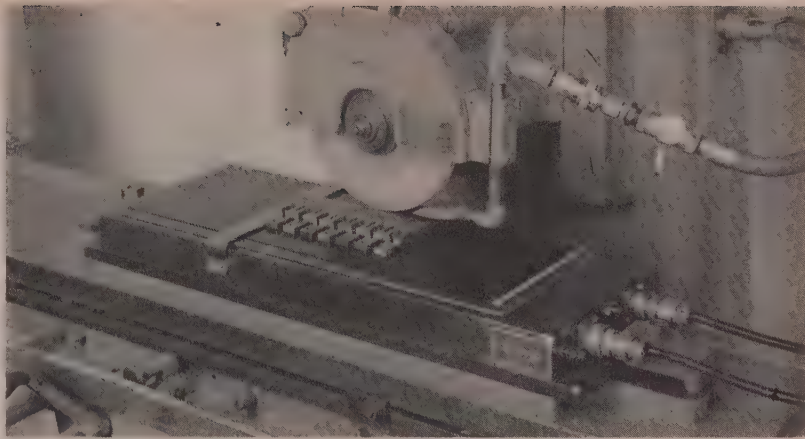
Previous operators produced products not suited to the plant's equipment, Harvey contended. If the plant were dismantled, he added, the presses might be sold at bargain prices to extruders' customers, which would result in a further loss of extrusion business to captive plants.

Reynolds To Keep Reduction Plant Running

Reynolds Metals had all but formally closed its Arkadelphia, Ark., reduction plant in December, but a few days before the plant was to close, the company decided to keep it running at a reduced rate. The plant has been operating at 27,500 tons (half of its rated capacity). Under the new plan, production will be cut another 25%.

When it became known that Reynolds was about to close this plant, Arkansas Governor Faubus and Senator Fulbright became sufficiently alarmed to discuss this with Reynolds. At the time, it was suggested to keep the plant running by having the government buy the metal and hold it for five years. At the end of that time or sooner, Reynolds would repurchase the metal.

Reynolds stated they could not afford to stockpile the metal themselves, but would contract to repurchase it from the government. The state of Arkansas, being sensitive about unemployment, apparently made some provision through which the plant would stay open. However, there was no explanation as to the change in plans.



New Electrostatic Chucks Hold Metals, Nonmetals

While resembling standard magnetic chucks in method of use, new electrostatic chucking equipment produced by Electroforce Inc., Fairfield, Conn., operates on entirely new principles.

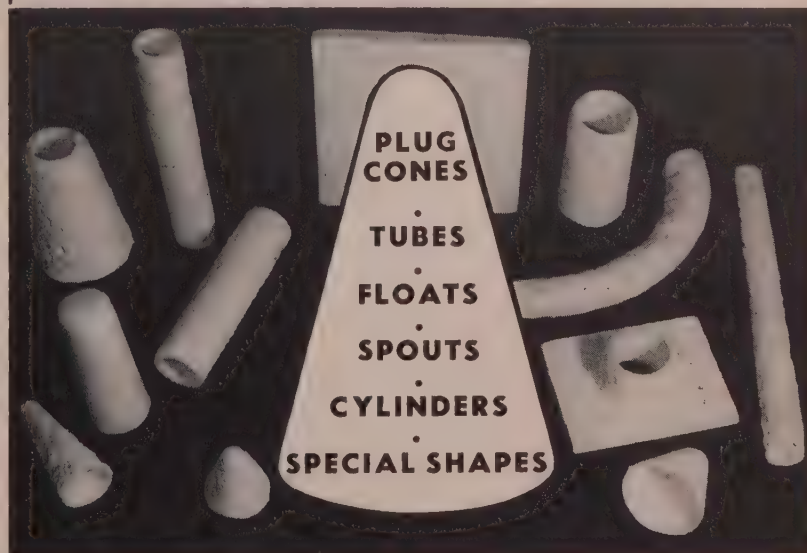
Chucks are said to be the first to achieve practical application of electrostatic force for chucking small parts.

Any electrical conductor such as aluminum, magnesium, copper, etc., as well as ferrous metals, can be held on this chuck. Even ceramics or plastics can be held if the holding surface is flashed with a metallic coating as little as 5 millionths-inch thick.

Components of the system include the chuck itself, designed for use on standard surface grinders; a power supply; Dri-Box in which work is kept moisture-free; and coolant pump and filter which supply a clean dielectric coolant. Except for the use of the dielectric, non-aqueous coolant and the need for cleanliness on the holding surfaces, no special procedures are required.

The chuck comes with 6 by 18-inch working surface, or a 5 by 8-inch surface especially designed for use in experimental shops, tool rooms, laboratories and for small production runs.

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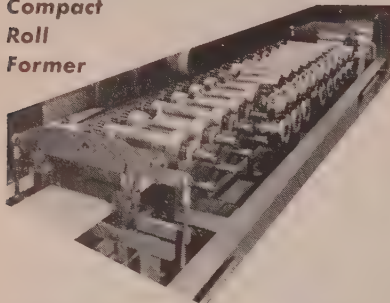
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West Coast Extruder Operating New Billet Caster

A large billet casting machine is now in production at the City of Industry, Calif. plant of Michael Flynn Mfg. Co., extruder and building products manufacturer.

"The installation is quite large in that the weight of metal per drop is very heavy compared to most installations for extrusion plants," a Flynn executive said at the company's Philadelphia headquarters.

The machine, which is almost completely automatic, simultaneously casts 26 six-inch logs, each 20 feet long, per hour for an hourly consumption of more than 20,000 pounds of aluminum.

According to Lobeck Casting Processes, Inc., New York, builders of the machine, it features an exclusive mold design and the Lobeck automatic metal flow control minimizes manpower requirements.

Metal Faced Ceiling Tile Can Be Cemented, Hung

Johns-Manville has developed a new sound-control panel called Solo-Tile, which the company reports is the only metal-faced acoustical tile that can be cemented in place (see illustration at right) or installed by concealed suspension systems.

Solo-Tile is a "perlite plus aluminum" acoustical unit. It is incombustible. There are two patterns of Solo-Tile. One is called Random-Bold. It has unusually bold hexagonal punches interspersed with smaller ones. The other is called Regular-Diagonal. It has small punches in neat rows. On all four edges and at each perforation the metal facing clinches to the base material to provide a firm mechanical bond.

The metal facing is thin-gauge alu-



minum with a white, baked-enamel finish. The base material is a rigid, dense, multi-cellular board that is formed from expanded perlite particles, mineral binders and fibers. Solo-Tile is easy to clean with water and any good detergent.

Aluminum Hand-Hoists Are Strong, Lightweight

Strength and light weight are features of the Wright Aluminum Safeway hand hoists. Using aluminum in non-load carrying components to decrease weight, they have been designed for portability by the Wright Hoist Division, American Chain & Cable Co., Inc., York, Pa.

Lightweight and rugged in construction, load-bearing parts are of strong, ductile, shock-resistant alloy steel. Aluminum has replaced heavy steel covers, heavy steel hand chain, and other parts such as chain guide and nut, to make it a much lighter, more easily portable hoist.

Self lubricating, only an occasional refilling of the oil reservoir is necessary to lubricate the hoist. The chain and load wheel are lubricated by a wick-type oiler fed from the reservoir, while the gear train is enclosed in a permanently lubricated, oil tight chamber.

None of the features of the original Safeway hoists have been omitted. Its planetary system gear train is built from modified involute stub tooth gears, with all gear teeth cut from solid steel blanks. Its load brake, with uniform composition lining and silent pawl, is of the Weston type.



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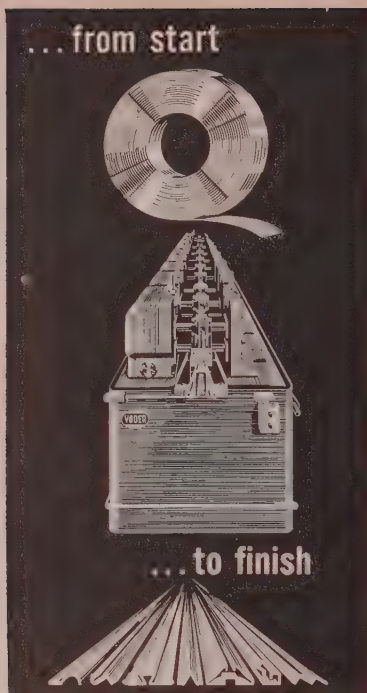
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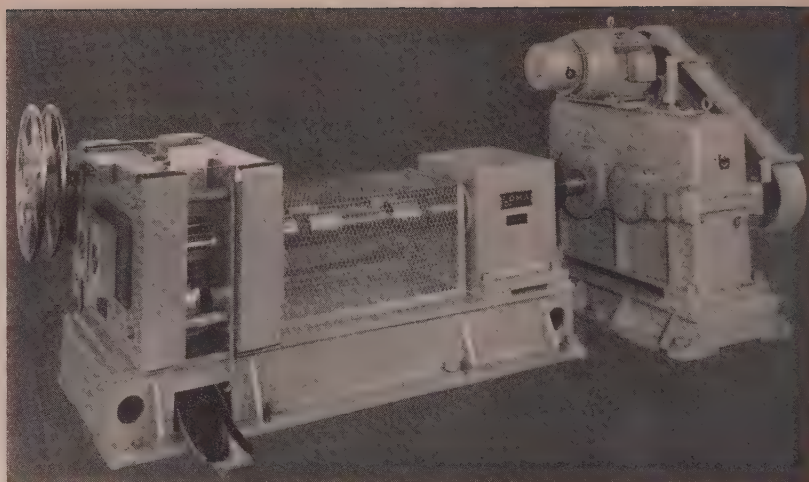
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Powder Rolling Mill Designed for Small Plants

A horizontal compacting mill with patented edge control has been developed to bring the Naeser-Zirm powder rolling method of thin-gauge strip production within reach of the small fabricator and the pilot plant.

Designer and builder of the new equipment is Loma Machine Mfg. Co., 114 E. 32nd St., New York. Although the unit is well suited to the production of aluminum strip, it is also being used in the manufacture of nuclear fuels, nickel tube parts, stainless steel filters and copper radiator stock.

The new machine employs 10 inch diameter by 8 inch wide rolls made of alloy tool steel and hardened to Rockwell C-64. The two rolls are mounted side by side, unlike those of a conventional mill.

In operation, fine metal powder is continually fed into the mill through a hopper equipped with flow controls.

Green strip leaves the mill on an exit chute at speeds varying from 12.5 to 50 fpm and is passed continuously into an atmosphere sintering furnace.

Then, it is reduced on a 2-high hot mill and further passes on a 4-high cold mill. The purity of the compacted strip is limited only by the purity of the original powder, and 99.9% metal purity at 100% strip density is readily obtainable, according to Loma.

The new compacting mill has a Heck edge control device comprised of a pair of special elastic disks that rotate at the roll edges to form the strip to exact width with a square edge, void of notches and cracks.

One set of pressure rollers forces the disks against the rolls at the bite, while another set lifts the disks away from the roll body beyond the bite. Thus, strip can leave the roll gap without side friction.

Giant Telescope to Use 7 Acres of Expanded Aluminum

Seven acres (320,000 square feet) of expanded aluminum will cover the entire area within the "dish" of the world's largest telescope, to be built at the U. S. Naval Radio Research Station in Sugar Grove, W. Va.

The metal, supplied by Penn Metal Co., Inc., Boston, will be sent to the Columbus Div'n of North American Aviation Inc., which will fabricate and assemble aluminum reflector panels.

The expanded metal has a special mesh called Squarex, developed as a reflecting surface for radio, radar and telemetry reception. It was chosen because it provides constant response for radio energy regardless of polarization, is light in weight, and has inherent structural strength which will help to prevent distortion with movement of the reflector, explains Penn. Its square openings are large enough to minimize

wind resistance—a vital factor because of the huge area of the telescope.

When completed, the unit will be 60-stories tall, and will be the largest movable structure in the world.

New Pre-Paint Lines for Alcoa-Davenport Works

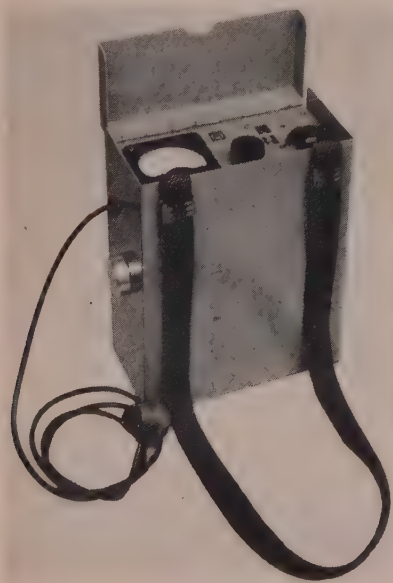
A new pre-paint line for producing coated coiled aluminum sheet up to 24 inches wide has been placed in operation at the Davenport, Ia., works of Aluminum Co. of America.

Another line capable of producing 48-inch widths of Alcoa's Tone-Cote is also nearing completion at Davenport. Both will supplement a 60-inch line in operation at the Alcoa (Tenn.) works.

The new facilities will pretreat and enamel sheet in a continuous cycle. A continuous chemical treatment, ap-

plied to the aluminum prior to the enamel applications, and a subsequent controlled baking cycle, enables Tone-Cote finish sheet to resist chipping, flaking, peeling, blistering and cracking.

It is available in 20 standard colors, in thicknesses of .015 to .051 inches. Either one or both sides of the sheet may be coated simultaneously, with one side one color, and the other in a contrasting tone.



Sensing Device Indicates Presence of Various Alloys

A device which differentiates between the various alloys of aluminum, magnesium and copper by indicating the difference in conductivity of a layer near the surface of a work piece has been developed by Schuco Scientific, Division of Schueler & Co., New York.

By special arrangement of the circuit, the sensing head of the Sortationer has been made relatively insensitive to distance. It will give a virtually constant reading even if the head is not kept absolutely square on the surface or if the surface is uneven. It will also give constant readings whether the surface is anodized, painted or both.

The Sortationer can be used to identify materials; to show degree of heat treatment; to distinguish in many instances between annealed and unannealed alclad; to show heat damage to many treated alloys; to indicate which side of single sided aluminum coated shell is clad; and to indicate the degree of heat treatment of a particular alloy.

It will differentiate pure aluminum and pure magnesium from all their alloys and will also differentiate between tantalum and niobium and between gold and silver and their alloys.



4

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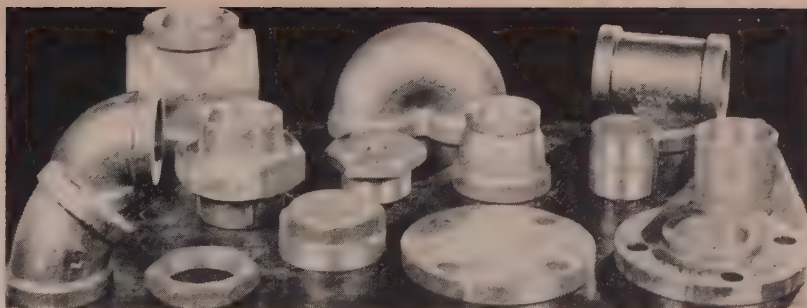
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This new Dow plant produces aluminum coil and flat sheet, in alloys 1100, 3003, 5005, 5050, 5052, 5357, 5457, 5557. Typical commodity items are residential siding sheet, lamp base stock, weatherstrip, fin stock, and building sheet.

The centralized location of this new aluminum source means short transit times to customers in the area shown on the map above. And quick in-plant order handling adds up to short order-to-delivery time.

Send for it! There's a wealth of information in Dow's new Aluminum Mill Products data book . . . important details on alloys, sheet sizes, and facilities. Write today for a copy. The Dow Metal Products Company, Midland, Michigan, Merchandising Dept. 1105 CQ1.

U M



Fittings Made for Aluminum Pipe 1/8-4 Inches in Diameter

A line of threaded aluminum pipe fittings for pipe sizes ranging from 1/8 to 4 inches in diameter has been developed by Latrobe Foundry Machine & Supply Co., Latrobe, Pa.

Couplings and nipples are made from 6061-T6 aluminum tubing and other fittings are made from B214 cast alumi-

nium alloy. Thread is American Standard Taper A.S.A. B2.1.

The aluminum piping and fittings are said to be suited for industries which handle high purity or corrosive fluids. Other uses include stair and guide railings; piping systems in petroleum and chemical industries, etc.

Welding Cuts Aluminum Cylinder Production Costs

Heavy-wall aluminum cylinders can be welded faster, more economically, in fewer passes and with less total heat input, with a relatively new technique called square butt welding, claims Linde Co., New York.

National Steel & Shipbuilding Co., San Diego, is gaining these advantages using Linde's MIG (Metal-Inert-Gas) welding equipment.

Previously, metal-arc welding of 1 1/4-inch thick aluminum cylinders for nuclear uses required edge beveling; preheating; welding on one side, back-chipping and welding of the opposite side; and several stringer-bead passes to complete the joint.

National claims it has eliminated all these operations with square-butt welding. Only the simplest joint preparation is required: A clean, square, end-to-end joint. Where minimum weld reinforcement is desired, a shallow vee-joint is used.

MIG single-pass welds, one from each side, result in full build-up and penetration. Radiographic tests show 100% "water-clear" welds.

Square-butt, high-current, welding, enables the welding of heavy aluminum plate at currents considerably above 400 amperes. Previously, attempts to exceed 400 amperes resulted in arc instability, severe oxide folds between weld layers, and weld porosity.

Square-butt welding incorporates improvements in gas shielding and purity, wire quality, and the slope-controlled power supply to overcome arc instability.

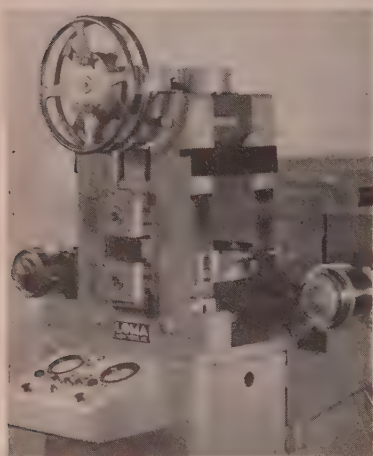
MIG welding's higher currents (up to 600 amp.) increase heat input at the



weld zone and eliminate porosity, since the puddle remains molten long enough for porosity-forming gases to bubble out. Yet, MIG reduces total heat input, since only one pass is required from each side, instead of several stringer-bead passes. The results are minimum distortion and reduced machining and scrap.

National mounts 30-inch diameter 6061 aluminum cylinders on a rotary positioner beneath a SWM-2 welding head (see photo). Joint edges are square-machined for cleanliness, and incorporate a 3/8-inch chamfer for minimum reinforcement. One-pass welds are made from each side at relatively low current (400 amp.) and 27 volts, using Oxweld 23 aluminum wire, 3/32-inch diameter. Argon shielding flow is 100 cfh. Welds are made at a speed of 8 ipm.

NEWS FROM LOMA



This rugged and versatile reversing 2-high/4-high combination mill brings high-precision rolling of thin-gauge ferrous and non-ferrous strip within reach of the smaller re-rolling mill, metals pilot plant and research laboratory. Occupying only 35 sq. ft. of floor space and involving a cost of less than \$20,000, the machine handles up to 6 in. wide strip at rolling speeds up to 250 ft. per min. with accurate front and back tension control.

The new 8 in. mill is furnished with two sizes of 4-high work rolls, made of either alloy tool steel or solid tungsten carbide; the 1½ in. size is used for normal cold reduction down to 0.002 in. thickness, and the ¾ in. size allows special ultra-thin finishing to gauges of less than 0.001 in. In the 4-high setup, the machine handles up to ½ in. gauge; the 2-high arrangement is used for the hot or cold breakdown of heavier materials up to 1 in. thick, but is also available for skin pass rolling of thin strip.

The production of close-tolerance stock is assured by an exceptionally rugged mill design, employing steel housings of 160 sq. in. post area, super-precision needle roller journal bearings of 175,000 lb. separating force capacity, a heavy-duty mill drive with herringbone gearing and universal joint spindles, and twin-hand wheel worm drive screwdowns. The machine is powered by a four-speed reversing drive offering constant horsepower from 40 to 250 ft. per min. rolling speed.

The outstanding feature of the new machine is its reversing strip coiling attachment allowing the two-way rolling of strip under tension control with no more effort than a mere flick of a selector switch. Mounted on brackets at either side of the mill, the two coiling shafts carry 8 in. diameter reels designed for a coil buildup of 6 in. Both shafts are driven from the pinion stand and are provided with dual air-operated slip clutches and brakes of ultra-sensitive, low-inertia design. Selective operation through solenoid valves and pressure regulators precisely controls the front and back tensions desired for any given mill pass.

LOMA
MACHINE MFG. CO., INC.
114 East 32nd Street
New York 16, N. Y.



Giant Rectangular Ingot Cast for Submarine Hull

What is claimed to be the largest rectangular aluminum ingot ever made has been cast by Reynolds Metals Co.'s McCook, Ill., sheet and plate plant for use in the company's program to build the Aluminaut—the aluminum research submarine designed to explore the ocean's depths three miles down.

Inspecting the 31,750 pound ingot (above), measuring 26 by 72 by 180 inches are John Larson, McCook plant

manager (left), and V. M. (Max) Gray, plant cast house superintendent.

The ingot will be forged into the first of several cylindrical rings which when joined together will form the submarine's 48-foot long hull. Reynolds says aluminum is believed to be the only practical material strong enough to resist the external pressures at super-depths. A similar-sized steel hull would be too heavy to return to the surface.

Wells Aluminum's Lew Laderer Heads Extruders Council



jectives will include projects on broadening the extrusion market base, and alleviating the seasonal aspect of the extrusion business, which results from the building slow-down during the winter months.

The biggest problem facing the extruders has been the price-cutting. Consequently, the AEC's new president, Lew Laderer, who is also president of Wells Aluminum, North Liberty, Ind., has stressed the idea of burying the hatchet with aluminum producers and eliminating unsound business practices such as price protection, extended credit terms, and commodity pricing.

To accomplish this, Laderer has set out to strengthen divisional units of the council, hold more area meetings, and improve AEC's communications program and public relations.

The council will also deal with merchandising, market research, and development of new applications for extrusions in an effort to reverse the ratio between extrusion demand and supply—the latter being double or triple the size of the market.

The Council's first 1961 meeting will be held in March at the Blackstone Hotel in Chicago. The council will launch its "new look" by getting speakers who can talk with authority on how aluminum extrusions can be sold in greater volume and at prices which can reverse the substantial losses now being encountered by most extruders.

The Aluminum Extruders Council, formed during the Korean war in an effort to get more metal for its members, has entered the second phase of its existence. The initial membership consisted largely of eastern extruders, and the group grew to only 30 to 40 members in the past decade. As the emphasis started changing last year to technical advances and cost cutting subjects, more extruders became interested in joining.

The fundamental change now taking place should expand the membership to 60 or 70 of the 118 firms now producing aluminum extrusions. New ob-

Aluminum Mills Opens North Chicago Plant

The new half-million dollar plant of Aluminum Mills Inc. is now in operation at 1660 Deerfield Road, Highland Park, Ill., a northern Chicago suburb.

Miles W. Abel, president of the firm, says monthly capacity is 500,000 pounds of coiled sheet, ranging in gauge from .125 to .006 inch, and in widths to 20 inches. Sheet is available in non-heat-treatable alloys.



Oil Well Rig Dismantles for Transport

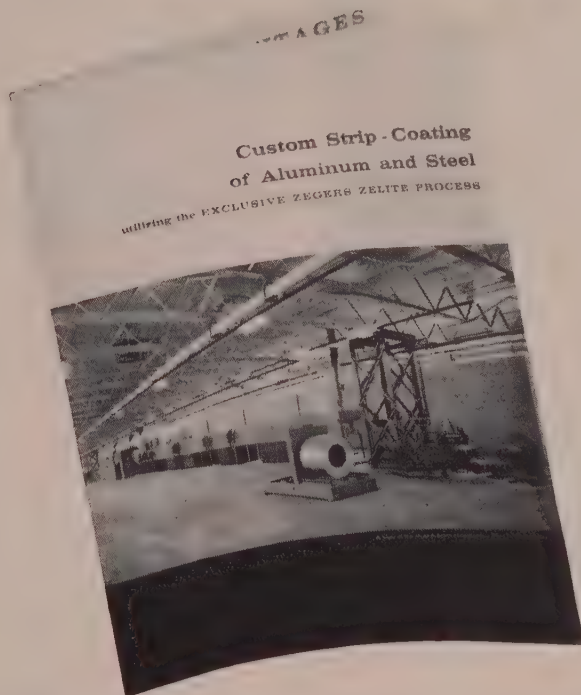
This oil well drilling rig, now in operation in Bolivia, is unique in that it is designed for air transport by cargo plane or helicopter. The deck and the entire substructure, as well as many other components of the rig are made of aluminum, which cuts its weight to less than 400,000 pounds, or about half the weight of the conventional, all-steel rig.

The substructure is fabricated by Ideco Division of Dresser Industries, Beaumont, Texas. Reynolds Metals Co. collaborated with the Division in its design. The substructure weighs about 30,000 pounds, a weight saving of about 60% over an equivalent base unit made of steel.

Other aluminum components in this air transportable rig include mud ditches, tanks, crow's nest, handrails, racking platforms, low pressure piping and equipment skids. Alloy 5456, a magnesium-bearing alloy, was used because it exhibited superior corrosion resistance in tests with drilling muds.

All rig components are designed to be transported in "packages" not exceeding 4000 pounds weight for helicopter transport and not exceeding 8 by 8 by 28 feet in size for cargo plane transport.

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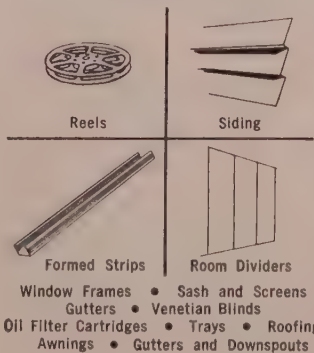
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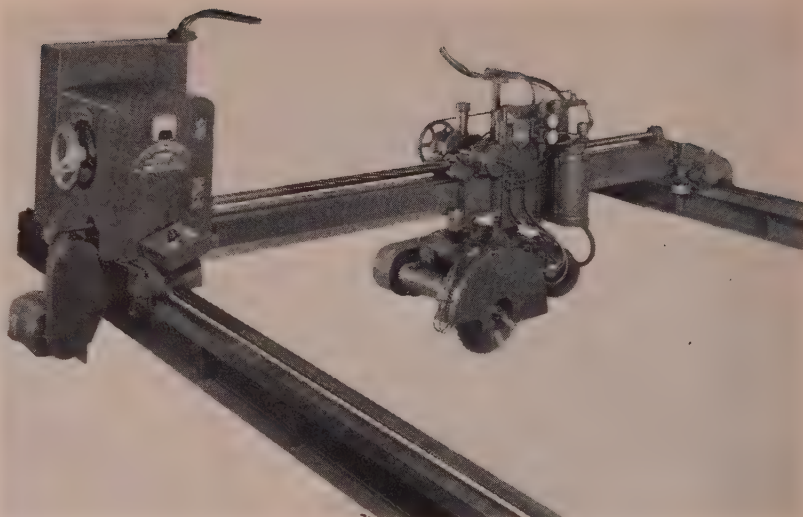
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Economical Plate Saw for Use in Aluminum Warehouse

An economical aluminum plate saw for warehouses, fabricators and manufacturers has been developed by Ty-Sa-Man Machine Co., 820 White Ave., Knoxville, Tenn. Designated 111CX, the new 15hp saw produces squared rectangles up to any length and up to 10 feet wide from stock up to 2 inches thick.

Saw has motor and blade arbor which travel on a transverse rail which in turn moves along two side rails. This four-way movement, in combination with a 90° swivel head, permits trimming all four sides of a plate without moving it.

A V-belt drive produces proper speeds for different alloys. The saw's spray-mist cooling system is air operated.

Heat-Sealable Adhesive Dries Transparent on Foil

A heat-sealable adhesive for aluminum foil, that can be sprayed, roller coated or brushed on, and which dries completely transparent, has been developed by Rubba, Inc., 1015 E. 173rd St., New York 60.

Although the applied adhesive is practically invisible, when foil is placed in contact with itself or other surfaces, an instantaneous bond is obtained merely

by the application of heat.

Rubba-Foil eliminates the need of costly cementing machines, together with clean-up time required when using liquid adhesives while packaging. Foils coated with Rubba-Foil can be used in the manufacture of decorative displays, toys and novelties.

The adhesive is packaged in 55-gallon drums and in 1 and 5-gallon containers.

Coast Firm Develops Colored Titanium

A unique coloring process for titanium has been developed by Hi-Shear Corp., 2600 W. 247 St., Torrance, Calif. It coats the metal in brilliant, uniform colors without the use of dyes or paints and can be used to apply more than one color to a single piece of titanium.

Products so colored have the ability to remain color-fast to temperatures to 600°F. Thus, this advantage make Hi-Shear's coloring process highly suitable for high temperature name plates and the color coding of fasteners, valves, nuclear reactor components as well as chemical pipes and fittings. Additionally, many commercial titanium products can be eye appealing as well as corrosive resistant. For instance, colored marine titanium hardware subjected to salt air would not require polishing nor would it pit or rust.

The novel coating, when applied to titanium nuts and bolts, alleviates the galling condition normally encountered on male and female thread combinations. Other basic characteristics revealed in qualifying tests indicate the following: The same or better corrosion properties than the base titanium. Inert to all basic solutions and most acids. Weather resistance proven by atmospheric exposure for 6 months with no effect regarding color change or wear. No change observed after 100 hour salt spray. Color-fast when exposed to nuclear radiation.

Physical properties of the base metal, such as shear, tension and fatigue, remain unaffected. No hydrogen pickup or organic dyes. The coloring process is applicable to all alloys of titanium. The process can be controlled to pro-

duce an electrically conductive or non-conductive coating.

For impact extruding of titanium in mild applications, the color coating serves as an anti-galling agent. In severe applications, the coating will act as a lake to hold a lubricant. U. S. patent has been applied for.

Aluminum Cans Will Help Astronauts

Aluminum is important to man's flight to outer space, reports Lt. Col. Albert A. Taylor, Chief of the Biomedical Division, Directorate of Life Sciences, Andrews Air Force Base, Washington, D. C.

"Isolation, tension, anxiety, monotony, restrictive clothing, and protective equipment will subject the space traveler to considerable stress," he says. "Food should help counteract this."

Plans for feeding systems include the use of aluminum cans for liquids. The bottom and top of these aluminum cans can be removed by tear strips. Solid foods will be in bite-size form, each bite individually wrapped. Perishable bite-sized foods will be packaged in foil.

"Formulation of this feeding program using aluminum containers is based on flight feeding requirements; the experience of crews who have flown high altitude aircraft, and those who have made high altitude balloon flights, as well as a variety of laboratory studies," Col. Taylor explains.

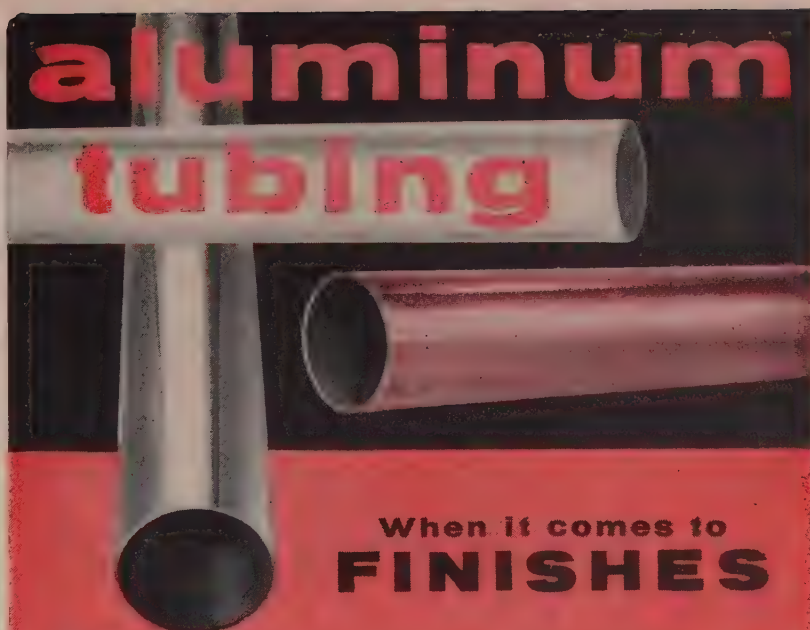


Magnesium Bridges Span Split Industrial Areas

A new line of standard industrial bridges for spanning depressed rail spurs and other divided areas in plants and warehouses has been developed by Magline Inc., Pinconning, Mich.

Constructed of magnesium, the movable units are of a compact design which permits easy positioning and removal with a fork truck. Range of models covers standard sizes from 10 to 24 feet long. Load capacities range up to 16,000 pounds. Special sizes can be made.

Units have tire-saver safety curbs, flared curb ends for wide angle turns, and beveled edges for smooth, bump-free access. Cable eyes and fork lift loops are optional, and pillow block type steel hinges for permanent installation are available.



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48-Inch Line to Boost Kaiser's Roll Coating Capacity

A roll coating line capable of painting aluminum coiled stock up to 48 inches wide is being installed in the Ravenswood, W. Va., works of Kaiser Aluminum & Chemical Corp. The new line will handle coil in gauges from .006 to .064 inches. Expected to be in operation by mid-summer, it will augment existing 66-inch and 18-inch roll coating lines already in operation at Ravenswood.

End product of these paint lines is roll-coated coil stock called Kaiser-Kote, major uses of which include awnings,

residential siding, license plates, miscellaneous building materials and panels for the mobile home industry. The material can be adapted to conventional forming methods such as bending, brake and roll forming, crimping, blanking or flattening without damaging the finish.

Available in a wide variety of colors in newest types of paints, and in finished widths from 2 to 66 inches, Kaiser-Kote can be coated on either one or both sides, depending on customer specifications.



Box Annealing Furnace Has 300°F to 1400°F Range

A box recirculating furnace that can be used for annealing, tempering and stress relieving of both ferrous and non-ferrous alloys in a wide operating temperature range of 300°F to 1400°F is a product of Sunbeam Equipment Corp., Meadville, Pa.

Both small and large parts may be heated together under accurate temperature control, and a positive pressure, high volume fan assures rapid and uniform heating of the work being processed, says the firm.

The unit is available for gas fired or electric heating in seven standard sizes.

Paint-to-Aluminum Adhesion Increased by New Coating

Chemlok 720, a chemical surface treatment for aluminum, greatly improves the adhesion of paints, lacquers, enamels, adhesives and other coatings to the metal, according to Hughson Chemical Co., Div'n of Lord Mfg. Co., Erie, Pa.

With all air-dried lacquers and enamels (acrylic, cellulosic, butyrate, etc.), Chemlok 720 produces excellent adhesion, says the firm. With baked finishes (acrylic, vinyl, urea alkyd, melamine alkyd, epoxy alkyd, epoxies, etc.) it gives improved results.

Adhesion obtained with Chemlok 720 is stronger than the coating applied—the paint film will fail cohesively rather than strip off the aluminum, according to Hughson. This means that new highly resistant paints and coatings adhere until completely weathered away, assuring long-term protection.

Further, Chemlok 720 is a cathodic treatment, this purportedly preventing

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undercutting and blistering of paint films. Retention of the paint or coating itself prevents corrosion of the underlying metal.

Other claims: Chemlok 720 does not affect the base color of aluminum and can be used with all paints or clear coatings; no sludge is produced in treatment tanks; it is adaptable to batch or continuous processing with either spray or immersion equipment; results are uniform and reproducible.

Gutters, Downspouts Coated With High-Purity Aluminum

A new line of embossed aluminum gutters and downspouts, made of high strength aluminum sheet encased in a glare reducing, high-purity aluminum coating, is called Satin Mist by Reynolds Metals Co., Richmond.

The .032-inch gutter and .024-inch downspout thicknesses exceed FHA requirements by almost 20%.

The gutter will be available in 5-inch ogee style and in lengths up to 20 feet with lap joints to cut installation time, eliminate soldering, provide a weather-tight seal and allow for seasonal contraction and expansion.

Alkaline-Solvent Compound Strips Acrylic, Alkyd, Etc.

An alkaline-solvent compound, designed to strip acrylic, alkyd, and other resistant paint finishes, and called Oakite Stripper 150, has been developed by Oakite Products, Inc., 19 Rector St., New York.

The compound is claimed to remove difficult paints in a simple soaking operation. It may be used in ordinary steel tanks, is safe on steel and magnesium, and inhibited against attack on aluminum, zinc, and brass. It has no flash point, and contains no phenolics. A wax seal on the surface of the compound retards evaporation, increases life of the stripper.

Men-on-the-move

Five Alcoa officials have been elected to new positions: **Harold C. Erskine**, from vice president in charge of production, to executive vice president; **Edward B. Wilber**, from vice president and treasurer, to vice president in charge of finance; **John D. Harper**, from assistant production manager, to vice president in charge of smelting and fabricating; **George W. Streepey**, from assistant production manager, to charge of the raw materials and refining divisions; and **Matt W. Stanley** from assistant treasurer, to treasurer.

Edward C. Manix is a new vice president and general manager of sales for Quaker State Metals Co., a division of Howe Sound Co., New York. He formerly

was with Nichols Wire and Aluminum Co., Davenport, Ia.

New director of marketing for DeSoto Chemical Coatings Inc., Chicago, is **Frank B. Kreider**.

William J. Edmunds has been appointed general manager of the industrial division of Kaiser Aluminum & Chemical Corp. He replaces **Stanley B. White**, now vice president, manufacturing (aluminum).

Joseph P. Hauf has been named to the newly created position of technical director, engineering, for the E. W. Bliss Co., Canton, Ohio. He was chief

engineer of the firm's Canton Div'n.

Loftus Engineering Corp., Pittsburgh, has appointed **William F. Kast** as assistant chief engineer.

Jack Morgan is new technical service manager of Foundry Services Inc., Berea, Ohio. He will administer the firm's program of technical consultation and assistance to foundries.

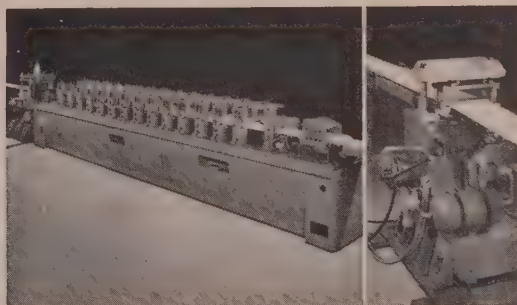
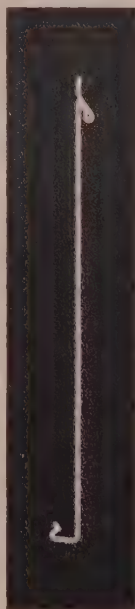
New chairman of the board of Copper and Brass Sales, Inc., Detroit, is **Sherman J. Fitzsimons**. He is former president of the firm, whose post has been filled by the board's recent election of **Curtis Carmichael**.



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Looking Ahead

If you're making money, run a good shop and are interested in being acquired, this may be the year to sell. A number of firms are currently on the prowl for "good" situations in aluminum. One outfit has picked up an Eastern extrusion plant; another an architectural fabricator; one a sheet mill; and several end-product makers are being wooed. In fact a major building product firm is being acquired by an aluminum producer with the result that its listed stock has become quite active and much higher in recent weeks. If the deal flops, a lot of hunch players will have a tax loss next year.

The small boat industry hopes to sell 370,000 units this year, a big gain over last year, according to boat manufacturers at the New York show this month. Of this amount, 140,000 will be aluminum. So say aluminum producers who formed a committee to help sell more metal to this bustling industry. Last year the industry reportedly consumed 37,500 tons of aluminum, 45,000 tons of plastic and fiberglass. On the basis of higher boat sales nearly 45,000 tons of aluminum will be consumed in '61. The hitch is: If plastics continue their 1960 gain, the demand for aluminum could well remain about the same as last year. One thing that might help aluminum is the Harvard report that structural flaws develop when plastic is exposed to water; that the plastic jobs are more expensive. It also panned immature designs in aluminum, however. So the battle continues.

Fastener manufacturers will find a large and lucrative market among firms that make aluminum products, even if aluminum shipments only approximate those of 1960. Better than 77% of the companies that replied to Modern Metals' recent fastener survey said they expect to increase their use of fasteners in 1961 (see report beginning on page 27). More than 41.5 million fasteners were used by only 13 aluminum window and door plants last year. Next month's installment of this continuing series of reports will give the lowdown on riveting and stitching aluminum.

Retailers in trouble? Furniture manufacturers and their customers who met this month at Chicago's winter furniture mart seem to think so. Newly-designed furniture was hard to find; most of the stuff looked like last year's models with a new paint job. Delivery? They could practically fill your order next week. Prices? They wanted to talk to buyers at night — and alone. Credit? You name it. When the word got around, the merchants started heading home; figured they'd be seeing the same salesmen in their shops — soon —

with even lower prices and quicker delivery. Same thing took place in New York's National Retail Merchants Association convention this month. Wary retailers appeared unwilling to stock up for spring; looked for better goods that cost less, on terms that almost eliminated the chance of being "turkeyed" on slow-moving merchandise. All of this caused many a manufacturer to cancel his Florida vacation; head back to the plant to shake hell out of the old place. Might even be a good thing. We did see a couple of outfits with something new to offer. They seemed to be busy.

The magnesium industry is passing through a fundamental change. Magnesium foundries and die casting plants, hard hit because of dwindling aircraft business, have been offered a "research and development" discount (about 20%) on magnesium ingot — an effort to make the metal competitive with other materials, particularly aluminum. Dow Chemical, the major magnesium producer, recently closed its magnesium die casting plant, leased its sand casting foundry to a competitor, and has opened a laboratory to help casting users and makers analyze the opportunities for magnesium die castings. Dow correctly got out of the casting business—a constructive move that will open new and expanded markets for magnesium castings.

Sheet aluminum price cutting is still a way of life with some mills. Example: Weatherstrip manufacturers who consume 20 to 30 million pounds a year, are being offered new low prices — which, they admit, they do not need to be competitive. The book price for this sheet item averages 52c a pound; the commodity price has been 49.5c. To make a long unpleasant story short, one manufacturer was happily buying the stuff at 42c this month. The seller should rescind or drop dead. But cutting doesn't stop here. An Ohio housewares manufacturer has been buying .019-inch sheet for 36.4c, while the "book" says it's 44.8c a pound. It's too late for ethics. What's needed is a pattern for survival.

Residential siding business is one bright spot for aluminum. Siding sales last year probably topped 170,000,000 pounds, nearly triple the amount sold in '57. Number of aluminum siding makers has snowballed since Alside and Alscot started in '47 (see article on page 44). Size of the industry grew slowly at first (five firms in '56) but has soared in recent years. There are about 40 siding makers today; could be as many as 60 to 70 within five years, as the trend to regionalism gains momentum. Some of the bigger outfits in the aluminum awning game look like prospective siding manufacturers. They're familiar with pre-coated sheet, and have the nucleus of a suitable sales setup.

—The Editors

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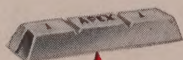
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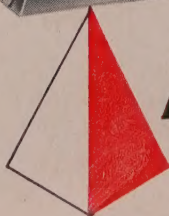
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